A STUDY TO ASSESS THE EFFECTIVENESS OF INTRADIALYTIC STRETCHINGEXERCISE ONMUSCLE CRAMPS AMONGPATIENTS UNDERGOING HEMODIALYSIS IN MORRIS MATHIAS HOSPITAL AT KANYAKUMARI DISTRICT

A DISSERTATION SUBMITTED TO THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILLMENT FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

APRIL 2015

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INTERNAL EXAMINER **EXTERNAL EXAMINER**

CERTIFICATE

This is to certify that this is a bonafide work of**.....** II year Msc Nursing,Thasiah College of Nursing, Marthandam, in Partial fulfillment of the requirement, for the Degree of Master of Science in Nursing.

Place: Marthandam**Principal**

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ACKNOWLEDGEMENT

I wish to acknowledge my heartfelt gratitude to the Lord Almighty for all the wisdom, knowledge, guidance, strength, protection, shield and support he has offered me throughout this endeavour and given me courage to overcome the difficulties and thus complete this study successfully.

It is my honour to thank our beloved chairman Mr. Thasian (Germany), for providing entire facility and encouragement for conducting this study.

I, consider myself to be privileged to express my honest and sincere gratitude to Prof. Mrs. Violin Sheeba, M. Sc.(N),**Ph.D; Principal cum Professor**, Thasiah College of Nursing, for her invaluable guidance, continuous support, promising criticisms, suggestions and concern during the entire course of this dissertation.

At this moment I convey my profound gratitude to Mrs. Vini, M.Sc.(N),**Head of the department in Medical Surgical Nursing** for her constant source of inspiration and timely correction of the manuscripts and sharing the suggestions and constructive criticism, which was a key for the successful completion of this study.

My heartfelt thanks to Mrs. Feby, M.Sc.(N),**Vice Principal** for her encouragement and support given during this work.

I express my deepest thanks to Mrs. Selin, M.Sc.(N),**Lecturer** Department of Medical Surgical Nursing for her guidance and suggestions for the completion of the study.

I express my thanks to entire **faculty of Thasiah College of Nursing**, Marthandam, for their co-operation and encouragement.

My sincere thanks and honour toMr.AntoPaulinBrinto, M.Sc., MEd, MPhil, PG., DBM, Professor of Bio statistics for extending his helping hands in the course of analysis and interpretation of the data collected.

I thank all the office staff for their help in taking photocopies of study reviews.

I express my deep sense of gratitude and heartfelt thanks to experts who have validated ,edited my study , devoted their valuable hours in solving my doubts and in providing meticulous attention.

I would like to express my thanks to the Study Participants for their co-operation and participation, without whom this study would have been impossible.

I am pleased to convey my profound thanks to the Management of Morris Mathias Hospital, Nagercoil for giving valuable suggestion ,guidance for data collection and also for giving permission to conduct the study in their respective hospital.I express my heartfelt gratitude to my beloved **husband Mr. C. Vijay Dinagar Singh**, my **son DevislinRiyo** and all my family members for their love, support, encouragement and prayer throughout my study.A word of thanks to my colleagues for their help and support throughout the course of this study.

Investigator

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ABSTRACT

The study was undertaken to assess the effectiveness of Intradialytic Stretching Exercise on Muscle Cramps among patients undergoing Hemodialysis in Morris Mathias hospital, Nagercoil at Kanyakumari Dist.

Objective

The over all aim of the research was to assess the effect of intradialytic stretching exercise in reducing muscle cramp among hemodialysis patients

Research Methodology

The researcher adopted a quantitative approach with one group pre testpost test design. Sixty patients with muscle cramp were selected, by using convenience sampling technique. Pretest was done with modified ashworthscale.Intradialytic stretching exercise was given for 20 minutes.Immediately after Intradialytic Stretching Exercise posttest was done by checking the muscle cramp of the patient with the same modified ashworth scale. The collected data were analyzed based on the above mentioned objective using the descriptive and inferential statistics.

Findings of the study

The study identified that the Intradialytic stretching exercise was effective in reducing muscle cramp among hemodialysis patients.It was found that there was a significant reduction of muscle cramp among hemodialysis patients after Intradialytic stretching exercise. The ‘paired t’ value was found to be 30.34,df=59,$P<0.05$.

Conclusion

From the results of the study it is concluded that rendering Intradialytic stretching exercise to hemodialysis patients was effective in reducing Muscle Cramps.

CHAPTER - I

INTRODUCTION

"The imagination is a muscle. If it is not exercised, it atrophies"

Neil Gaiman

Background of the Study

Health is the level of functional or metabolic efficiency of a living organism. In humans, it is the general condition of a person's mind and body, usually meaning to be free from illness, injury or pain (as in "*good health*" or "*healthy*"). The World Health Organization (WHO) defined health in its broader sense in 1946 as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity".

There are many conditions and illness that can be considered chronic. Recent focus in surveillance of chronic disease has been on 12 chronic conditions identified in the National Public Health Partnership's paper. These conditions pose a significant burden in terms of morbidity, mortality and health care costs in Australia, and are amenable to preventive measures. They are Ischemic heart disease, Stroke, Lung cancer, Colorectal cancer ,Depression ,Type II diabetes mellitus, Arthritis, Osteoporosis, Asthma, Chronic obstructive pulmonary disease, Chronic kidney disease and Oral disease**(Houseman.,2005**).

The kidneys play three major roles such as removing waste products from the body, keeping toxins from building up in the bloodstream producing hormones that control other body functions such as regulating blood pressure , producing red blood cells regulating the levels ofminerals or electrolytes (e.g., sodium, calcium, and potassium) and fluids in the body **(Chug., 2006).**

Chronic kidney diseases involve progressive, irreversible loss of kidney function. The kidneys have remarkable functional reserve up to 80% of the

glomerular filtration rate may be last with few obvious changes in the functioning of the body. A person is born with about 2 million nephrons and can survive without dialysis until almost 90% of the nephrons are lost. Chronic renal failure is a progressive detoriation of renal function impairment which leads to interfere with the metabolism of body water and electrolytes. 2-3% of the current world's population suffers from chronic renal failure and every year the rate increases twice **(Black.,2005**).

The two main causes of chronic kidney disease are diabetes mellitus and high blood pressure which are responsible for up to two-thirds of the cases. Diabetes Mellitus happens when blood sugar is too high, causing damage to many organs in the body, including the kidneys and heart as well as blood vessels, nerves and eyes. High blood pressure, or hypertension, occurs when the pressure of blood against the walls of blood vessels increases. If uncontrolled or poorly controlled, high blood pressure can be a leading cause of heart attacks, strokes and chronic kidney disease.

Most people may not have any severe symptoms until their kidney disease is advanced. However, the symptoms are feel more tired and have less energy, trouble concentrating, poor appetite, trouble sleeping ,Muscle Crampsing at night, swollen feet and ankles, puffiness around eyes, especially in the morning , dry itchy skin, need to urinate more often, especially at night**(Taylor., 2009).**

Chronic kidney disease is identified by a blood test for creatinine. Higher levels of creatinine indicate a lower glomerular filtration rate and as a result a decreased capability of the kidneys to excrete waste products. Creatinine levels may be normal in the early stages of Chronic kidney disease , and the condition is discovered if urinalysis (testing of a urine sample) shows that the kidney is allowing the loss of protein or red blood cells into the urine. To fully investigate the underlying cause of kidney damage, various forms of medical imaging, blood tests and often renal biopsy (removing a small sample of kidney tissue) are employed to find out if there is a reversible cause for the kidney malfunction **(Roco., 2008**).

Recent professional guidelines classify the severity of chronic kidney disease in five stages, with stage 1 being the mildest and usually causing few symptoms and

stage five being a severe illness with poor life expectancy. Stage five Chronic kidney disease is often called end stage renal disease (ESRD), end stage renal failure (ESRF), or end-stage kidney disease (ESKD) and is synonymous with the now outdated terms chronic kidney failure or chronic renal failure **(Roco., 2008).**

The standard treatment are hemodialysis for patient with renal failure. This method has improved the survival although some complications are associated with MuscleCramps. Dialysis is an artificial process used to purify the blood. Dialysis will not cure kidney disease but it removes the waste products and excess water from the body and stabilizes the blood chemistries. Hemodialysis removes waste products and excess fluid directly from the blood by pumping it through a filter called a dialyzer, or artificial kidney. A small amount of blood is continually removed from the body, pumped through the dialyzer filter and returned to the body. Only a small amount of blood was taken outside of the body at any time because it is a continuous process. The blood is returned to the body as fast it is removed **(Byton., 2012).**

Headache is a common symptom during dialysis although the cause is largely unknown. Acetaminophen (Tylenol) may be given during dialysis as treatment. Nausea and vomiting may occur during routine dialysis. Most cases are probably due to hypotension (low blood pressure). If nausea and vomiting persist, treatment may include giving medication for nausea and vomiting. Some kidney patients may experience a slowing of nerve function, called neuropathy. Symptoms include restless legs, tingling or painful burning of the feet, and weakness of the legs and arms. It is often described as an irritating sensation, especially in the calf muscles that can be relieved only by moving the legs and feet. It often happens at bedtime or when the patient is resting. Muscle Crampsing of the hands, feet, and legs is fairly common on hemodialysis. Muscle Cramps are more commonly associated with low blood pressure. However, some Muscle Crampsing continues even after a normal blood pressure is obtained. In fact, Muscle Crampsing can occur even without a fall in blood pressure. Muscle Cramps also can occur when patients are below dry weight. The severe Muscle Crampsing experienced near the end of the dialysis and persisting for a time after dialysis often is due to dehydration**(Shah., 2012).**

Patients undergoing hemodialysis (HD) are susceptible to sudden painful, involuntary contractions of skeletal muscle, commonly known as Muscle Cramps (involuntary muscle contraction associated with severe pain) occur frequency in patients receiving dialysis. Muscle Cramps can involve the legs, most commonly in the feet, but can also involve arms, hands as well as abdominal muscles**(Ajay.,2013).**

Muscle Cramps begin with fasciculation's or muscle twitches and are felt to be related to nerve conduction rather than the muscles themselves. Numerous factors contribute to Muscle Cramps in patients with Chronic kidney disease receiving dialysis and include volume contraction, tissue hypoxia, hyponatremia. Muscle Cramps may have serious consequences for patients who experience them. Muscle Cramps can be painful and this may impact quality of life. Cramps may also limit a patient's ability to tolerate dialysis.**(Agarwatt.,2009).**

The psychological impact of Muscle Cramps is often overlooked, yet Cramps have a significant impact on patient mood and quality of life. They are scored by hemodialysis patients as a particularly severe individual symptoms are linked with depression and poor quality of life. Repeated episodes of Muscle Cramps contribute to chronic pain, lack of sleep and illness intrusiveness which in extreme cases, has been implicated in patient decisions to ultimately withdraw from dialysis treatment**(British journal., 2012).**

Exercising within the first two hours of dialysis may lessen the severity of 'end-of-treatment' Cramps, or alleviate them altogether. The group have found from experience, however, that patients who Cramps at any point during treatment struggle to find relief using exercise. These patients often have issues with their target weight that need to be addressed before beginning exercise (**Grahn., 2008).**

In this study the investigator is interested to elicit the effect of intradialytic stretching exercise on Muscle Cramps experienced by the patients during hemodialysis.Muscle Stretching is a form of physical exercise in which a specific muscle or tendon (or muscle group) is deliberately flexed or stretched in order to improve the muscle's felt elasticity and achieve comfortable muscle tone. The result is a feeling of increased

muscle control, flexibility and range of motion. Stretching is also used therapeutically to alleviate muscle Cramps.

Need for the Study

Chronic kidney disease (CKD) is an important non communicable disease epidemic that affects the world population including India. The prevalence of end stage renal disease (ESRD) is raising throughout the developed and developing countries mainly due to diabetes mellitus and hypertension. When the kidneys are healthy, they clean our blood. They also make hormones that keep our bones strong and blood healthy. When the kidneys fails to do we need treatment to replace the work of the kidneys . Unless we have a kidney transplant, one will need a treatment called dialysis. There are two main types of dialysis: hemodialysis and peritoneal dialysis. Both types filter our blood to rid our body of harmful wastes, extra salt and water. Hemodialysis does that with a machine. Peritoneal dialysis uses the lining of the abdomen, called the peritoneal membrane**(Reddy., 2007**).

The world health organization (WHO) has predicted that if the current trend continues, India will become the 'diabetes capital of the world' by 2025 with over 57 million affected people. Diabetes 24 times more prone to heart diseases and 30 times more susceptible to renal problems than a non diabetic 30-40% of the cases of chronic renal failure 15% are due to hypertension(**Sankaranarayanan. G., 2005).**

There are currently 10,65,000 people on hemodialysis worldwide (European dialysis and transplant nurses association / European renal care association journal, 2005). Chronic kidney disease will kill 36 million people by the year 2015.

The Global and Regional Overview of end stage renal disease Patients at Year end 2001 represents that, total population of European union is about 380 million population, among them 2,98,000 patients have end stage renal disease and 1,96,000 were on dialysis. Total population of Middle east is about 271 million population among them, total patients were 40,000 and 29,000 patients were on dialysis. North America total population is about 311 million among them, total end stage renal disease patients were 4,36,000 dialysis patients were 3,04,000. In Africa total

population is about 833 million among them, total end stage renal diseasepatients were 46,000 population, total dialysis patients were 43,000, In Asia total population is about 3,316 million, total end stage renal disease patients were about 1,77,000 total dialysis patients were 1,46,000. Globally total end stage renal disease patients were about 14,79,000, total patients on dialysis were 11,41,000. In United states the number of patients treated with dialysis or transplantations is projected to increase from 3,40,000 in 1999 to 6,51,000 in 2 010 **(Johnson.,(2009).**

In India, 10 lakhs people suffer from kidney failure and more than four crores are at risk . It is estimated that there are about 55,000 patients on dialysis and the dialysis population is growing at the rate of 10-20% annually (**Vivek .Jha.,2013**).

In "Hindu" it was reported that the Chennai has become the capital of chronic kidney diseases and the result of survey showed the incidence of dialysis in Tamil Nadu is 25-36% where there are 985 persons in one lakh population suffers with chronic renal failure **Hindu.,(2001).**

On the basis of the recent survey of the ICMR (Indian Council of Medical Research), it is estimated that prevalence of diabetes mellitus in adults is 3.8% and 11.8% in rural and urban areas, respectively. Moreover, prevalence of hypertension has been reported to range from 20– 40% and 12–17% in urban and rural adults, respectively. Glomerulonephritis and interstitial nephritis were reported to be the predominant causes previously, however, recent data highlight the emergence of diabetic nephropathy as the major cause of End stage renal disease in India. According to the first annual report published by the Chronic kidney disease registry of India involving 13,151 patients, in this diabetes mellitus and hypertension were major causes of Chronic kidney disease **(McClellam.,2007).**

India has approximately 400 dialysis units with 1,000 dialysis stations,with the majority of being in the private sector. The patients who were started on dialysis 69-71% die on dialysis or stop treatment due to financial reasons, the majority within the first three months of initiation of dialysis and only 17-33% patients end up having a kidney transplant of the 8-10% who continue to be on hemodialysis and 60% receive

irregular treatment. Only 2-4% is started on continuous ambulatory peritoneal dialysis**(Agarwal.,2005).**

End-stage renal disease is associated with a large symptom burden. In one recent study, patients receiving dialysis reported an average of nine symptoms that resulted in impaired quality of life. Pain is extremely common in end-stage renal disease and can result from renal and nonrenal etiologies. In a prospective cohort study of 205 patients receiving hemodialysis, 50 percent reported a problem with pain. Musculoskeletal pain was most common (63.1%), followed by dialysis associated pain (13.6%), peripheral neuropathy (12%), and peripheral vascular disease (9.7%). The most common symptoms in hemodialysis and peritoneal dialysis were fatigue (respectively 82 and 87%) and itching (73 and 68%). In hemodialysis only a medium to high co morbidity age risk index was associated with greater symptom burden. In peritoneal dialysis also a lower percentage lean body mass, a lower glomerular filtration rate, and past episodes of underhydration were associated with greater symptom burden**. (Agarwal SK., 2006).**

Patient on chronic maintenance Hemodialysis are confronted with several complications related to the treatment Muscle Cramps being among the most common complaints is estimated to occur in up to 20% of hemodialysis sessions. Lee (1999) quoted in Dialysis and Transplantation journal that in a specific study involving hemodialysis treatment on 103 patients the cumulative incidence of Cramps was estimated to be 86% **(Lee., 1999).**

Idiopathic leg Cramps are common, occurring in 33% to 95% of adults. They are less common in children than in adults. Nocturnal leg Cramps occur in about 7% of children, begins only after 8 years of age attain its peak of prevalence at 16 to 18 years of age. Women (32% to 56%) experience Cramps more frequently than men (26% to 40%) and 75% of muscle Cramps episodes in adults and children occur at night. Idiopathic Cramps usually involve single muscles or part of a muscle, particularly the gastrocnemius. Most episodes involve the calf muscles (83%), followed by the foot muscles (40%). Local Cramps in other muscles are less common. However, they are frequently noted in the context of neuromuscular disease. The mean duration per episode is 8 to 9 minutes in adults, and 2 minutes in child. Most

affected children have infrequent Cramps (82% have 1 to 4 episodes per annum) **(Canzanlo.,1992).**

Since Cramps are a common intradialytic event, the discomfort leads to premature termination of the treatment, non compliance with the prescription and therefore under dialysis. This interfering with the Muscle Cramps and even preventing the occurrence become a major responsibility of the personal in charge of the patients. Since nurses are taking care of Hemodialysis patients almost every where it becomes predominantly the nurse's role to find remedial measure to alleviate muscle Cramps.Thus the investigator has opted to provide passive calf stretching exercises prophylactically during hemodialysis to relieve or prevent Muscle Cramps.

Based on the reviews and the investigator's personal clinical experience in dialysis unit the researcher found that more than 75% of patients attending hemodialysis unit is experiencing Muscle Cramps. So the investigator has interested in finding remedial measure for this Muscle Cramps and he has selected stretching exercise to prevent Muscle Cramps.

Statement of the Problem

A study to assess the effectiveness of intradialytic stretching exercise on Muscle Cramps among patients undergoing hemodialysis in Morris Mathias hospital, Nagercoil at Kanyakumari Dist.

Objectives

- To assess the level of Muscle Cramps among patients undergoing hemodialysis before giving intradialytic stretching exercise.
- To assess the effectiveness of intradialytic stretching exercise on Muscle Cramps among patient undergoing hemodialysis.
- To find out the association between the level of Muscle Cramps among patients undergoing hemodialysis with their selected demographic variables.

Hypotheses

H_1: There is a significant difference in the level of Muscle Cramps after intradialytic stretching muscle exercise among patients undergoing hemodialysis.

H_2 : There is a significant association between the level of Muscle Cramps among patients undergoing hemodialysis with their selected demographic variables.

Operational Definitions

Effectiveness

In this study it refers to the positive outcome expected by the researcher after giving intradialytic stretching exercise on Muscle Cramps among patients undergoing hemodialysis as measured by modified Ashworth scale.

Intradialytic Stretching Exercise

In this study it refers to exercise that is performed for hemodialysis patients at the end of second hour of dialysis such as stretching the calf muscles for 10 minutes, flexion, extension and rotation in clockwise and anti clockwise of the leg for 5 minutes, elbow flexion,extension and wrist circle for 4 minutes, Ball fisting in arms for one minute.

Muscle Cramps

In this study it refers to painful involuntary muscle spasm occurs in arms and legs during hemodialysis.

Hemodialysis

In this study it refers to treatment given for renal failure is rapid change of plasma, solute composition within four hours.

Assumptions

- Patient undergoing hemodialysis will have Muscle Cramps
- Hemodialysis result in sodium depletion in muscles
- Exercise involves stimulation of muscles and bones
- Intradialytic Stretching muscle exercise will be effective in reducing Muscle Cramps
- Calf muscle exercise improves perfusion

Delimitations

- The period of study is limited to 4 weeks
- The sample size is limited to 60
- The study is limited to the age group of 20 to 60 years
- The study is limited to only one hospital

Ethical Consideration

The proposed study was conducted after the approval of the dissertation committee of Thasiah college of nursing, Kanyakumari District, TamilNadu.. Assurance of confidentiality was given the samples and consent was obtained from the sample.

Conceptual Framework

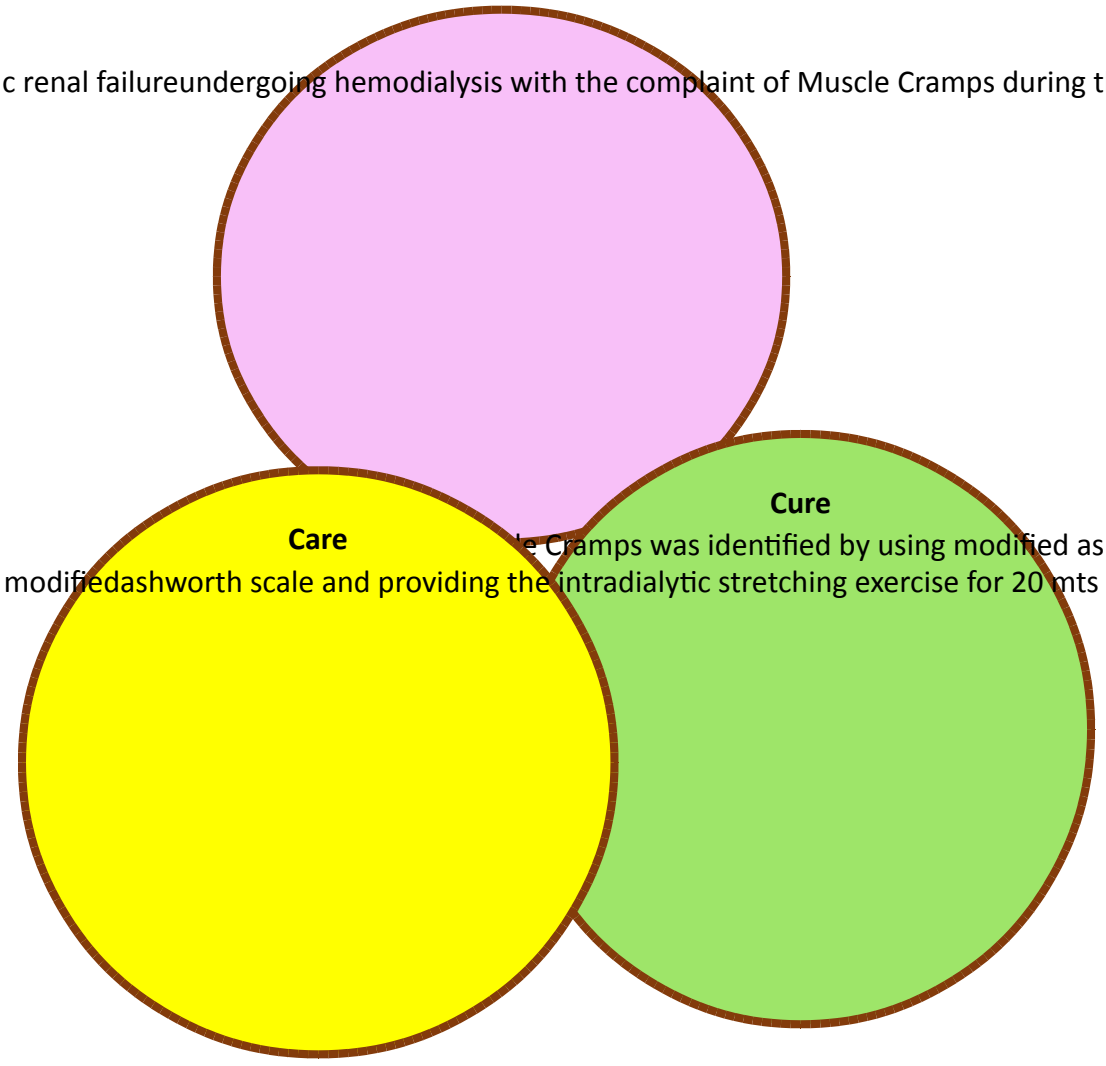
The conceptual framework adopted for the present study is based on Lydia. E. Hall's Core, Care and Cure model (1994). Lydia considered a basic philosophy of nursing upon which the nurse may based patient care. As a nurse theorist, LydiaE.Hall is unique in that her beliefs in nursing were demonstrated in practice. Hall presented her theory of nursing visually by drawing three interlocking circles core, care and cure. The three aspects are interrelated and influenced by each other. Nursing has major role in these three aspects.

1. **Core** circle of patient care is based on the concept that patient looks at and explore feeling regarding his or her current health status and potential changes ie, patients' problems. In the present study core deals with the persons who experience moderate to severe Muscle Cramps by age group of 20 to 60 years.

2. **Care** circle presents the nurturing component ie, the concept of mothering (care and comfort of patients) and provide for teaching learning activities. In this study care circle represent by providing intradialytic stretching exercise and post test assessment level of Muscle Cramps.

3. **Cure** circle of patient care is the evaluation of the pathological and therapeutic sciences applied by the health team members. In this study, cure part deals with response of the care provided for the study subjects by the researcher ie, reduction in the level ofMuscle Cramps.

o are with chronic renal failureundergoing hemodialysis with the complaint of Muscle Cramps during the second hour of d



le Cramps was identified by using modified ashworth scale

Cramps by using modifiedashworth scale and providing the intradialytic stretching exercise for 20 mts per day

Fig. 1: Conceptual Framework based on Lydia E Hall core, care and cure Model

CHAPTER - II

REVIEW OF LITERATURE

The review of literature is the key step in research process. It refers to a broad, comprehensive in depth, systematic and critical review of scholarly, print materials and audio visual materials(**B.T. Basavanthappa, 2001).**

The research studies are divided into 5 sections

Section A : Studies Related to Muscle Cramps During Hemodialysis

Section B : Studies Related to Intradialytic Stretching Exercise for Muscle Cramps

Section C : Studies Related to Stretching Exercise in Treatment of Various Clinical Pathology

Section D : Studies Related to Hemodialysis

Section A

Studies Related to Muscle Cramps During Hemodialysis

Cheryl R.Neal, (2007) conducted a comparative study to assess the effectiveness of Dextrose50 Vs Dextrose 5 in treating Muscle Cramps during dialysis. He selected 33 patients in which 18 patients were treated with D50 and 15 patients were treated with D5 Blood glucose level and blood pressure are monitored priorly for both groups. In this treatment 89% of subjects treated with D50 resulted in Cramps relief compared with 40% of treatment, partial relief 5.5% with D50 comparing with 40% of Cramps relief with D5w and 20% of subjects with D5w treatment experienced no Cramps relief. Hence the researcher concludes treatment with D50 is effective for Muscle Cramps during dialysis.

Mini Gupta, (2008) conducted a study on prevention of hemodialysis related Muscle Cramps by intradialytic use of sequential compression devices. He selected four audit patients (mean age 61± 14 years) on thrice weekly hemodialysis who experienced two or more episodes of lower extremity Crampsing weekly in the month before the study. The sequential compression device were applied on both legs before each dialysis and compression were intermittently applied at 40mmHg during treatment. As a result all four patients reported complete resolution of Crampsing during the study period. Hence the researches concludes application of sequential compression device to lower extremity may prevent the generation of lower extremity hemodialysis related Crampsing in a selected group of patients.

Liobet, (2008) conducted a comparative study on effectiveness of hypertonic glucose Vs normal saline for Muscle Cramps during dialysis. He selected 44 patients and he administered hypertonic glucose for 26 patients and normal saline for 18 patients. Treatment with hypertonic glucose reveals reduction of Muscle Cramps for 17 of26 patients, in contrast to only 5 of 18 episodes relieved with 50ml of normal saline ($P<0.016$). Hence the researcher concludes that hypertonic glucose seems to be safe and effective for the relief of dialysis induced Cramps comparing with 50 ml of normal saline for Cramps during dialysis.

ParvizKhajebdehi, (2009) conducted a randomized, double-blind, placebo-controlled trial of supplementary vitamin E, C and their combination for treatment of hemodialysis Cramps. He randomized 60 hemodialysis patients into four groups. Each group (n= 15) received six identical capsules daily for 8 weeks, containing one of the following: vitamin e (400g), vitamin C (250g), their combination. The frequency and intensity of hemodialysis Muscle Cramps decreased significantly in all three vitamin groups compared with the placebo group. At the end of trial, vitamin E, C, their combination and place to produced Cramps reduction of 54%, 61%, 97% and 7% respectively. Hence the researcher concludes that short-term treatment with the combinations of vitamin E and C is safe and effective in reducing hemodialysis Muscle Cramps.

Chiz-TzungChang ,(2009) conducted a study on effectiveness of creative monohydrate treatment on alleviation of Muscle Cramps associated with

hemodialysis. He selected ten patients with frequent Muscle Cramps during hemodialysis. He administered 12mg of creatine monohydrate before each dialysis session for 4 weeks to the study group. The incidence of Muscle Cramps during hemodialysis was compared between the two groups. Dialysis adequacy, hemodynamic status and side effects were also evaluated. At the end of 4 weeks the frequency of symptomatic Muscle Cramps decreased by 60% in the creative monohydrate treatment group. Hence this data suggest that creatine monohydrate can reduce the incidence of hemodialysis associated Muscle Cramps.

Wells, (2009) conducted a study to assess quantitatively the efficacy of quinine in treatment of nocturnal leg Muscle Cramps. He selected 107 patients and quinine sulphate was administered for 4 week periods. The researcher conclude his study that treatment with quinine sulphate reduce the number of night Cramps by 27.4%.

Sherif EL-Tawil, (2010) conducted a study on practice of using quinine for leg Cramps in patients receiving dialysis. In the study of 23 trials found that quinine 300mg daily for a period of two months reduced number of Muscle Cramps over two weeks by 28%, Muscle Cramps intensity by 10% and Cramps days by 20%. The researcher conclude that therapy with quinine upto 60 days was effective with no serious adverse events.

EI-Tainl, Musa, (2010) conducted a study to assess the effect of quinine administration and vitamin E for Muscle Cramps. He selected 29 patients on hemodialysis and divided into two groups as the experimental and the control group One group of 16 patients received 325mg of quinine daily and the other group of 13 patients received vitamin E 400 IU daily for a period of two months. the study reveals that quinine reduced Muscle Cramps to 3.3 per month and vitamin E to 3.6 per month (P at 0.005 for both groups) and this conclude that both treatment reduced pain severity due to Muscle Cramps.

Samra, (2010) conducted a study to assess effect of l- carnitine on quality of life,20 gm of carnitine was given for 8 weeks. The findings showed that carnitine supplementation results in increased hemoglobin level and decreased creatinine level

Section B

Studies Related to Intradialytic Stretching Exercise for Muscle Cramps During Hemodialysis

Dan Bayliss, (2006) conducted a study on intradialytic exercise program for hemodialysis patients and he selected 30 patients and intradialytic exercise program was taught and tests such as the six minute walk test, a gait speed test and sit to stand test was used to evaluate initial patient physical ability. The study reveals that there improvement in physical ability due to the exercise program in about 50% of the cases. Hence intradialytic exercise programmes are important to enhance the physical functioning and to improve overall health.

Kristen P.Koh, Robert G.Fasset, (2009) conducted a randomized controlled trial on intradialytic versus home based exercise training in hemodialysis patients at renal research centre. He selected seventy two patients to receive either intradialytic exercise training or home based training or usual care. The intervention were given for a month. The study reveals that home based training are more cost effective training program in hemodialysis patience. Hence the researcher conclude home based training has more benefits than the intradialytic training programme.

Mika L.Nonoyama, Dina Brooks, Devins., (2010) conducted a prospective longitudinal study on exercise program to enhance physical performance and quality of life of older hemodialysis patients. By convenient sampling technique, nine participants were selected and exercise programme was performed for three weeks and measured by duke activity index. The study reveals that patients showed a gradual increase in the amount of exercise performance over 12 weeks. Hence the researcher concludes these exercise program should benefits in the improvement of quality of life in above 60% among hemodialysis patients.

Tare – du Jung and Sun-Hee Park,(2011) conducted a study on intradialytic programs for hemodialysis patients. The exercise programme consists of two or three

times as week during hemodialysis with the moderate intensity for 30 minutes and lasting from eight weeks to twelve months. The researcher used Borg's 15 point scale for rating of perceived exertion. The study reveals that there is beneficial effect of intradialytic exercise in end stage Renal Disease patients, hence intradialytic exercise are needed in hemodialysis patients.

Fiona Hawke, (2012) conducted a study on non drug therapies for nocturnal lower limb Muscle Cramps in which, the researcher selected 80 people older than 55 year and 6 weeks intervention of calf and hamstring muscle stretch was given to the intervention group where as control group lacks intervention. After six weeks, the mean difference in change of Cramps frequency between group was – 1.2 (95%, cl – 0.6 to -1.8) Cramps per night in favour of the stretching group. This difference represents 35% reduction in Cramps frequency with stretching.

Susanne Heiwe and Helena Tollin, (2012) conducted a phenomeno graphic study on patients perspectives on the implementation of intradialytic cycling for dialysis patients. By purposive sampling technique eight samples were selected. The intradialytic cycling was consisted of 30 minutes of cycling at an intensity of 13-15 on the ratio of perceived exertion. The study reveals that the implementation of intradialytic cycling was experienced as positive as 70%. Hence identification of motivators in direct care is important to improve the standards of intradialytic cycling.

Section C

Studies Related to Stretching Exercise in Other Pathological Conditions

McAdam.M, Smith, (2007) conducted a study on light resistance and stretching exercise in elderly women on flexibility. He selected 46 women of age group of 65 to 89 years. 25 week exercise progress was given as ankle plantar flexion, shoulder flexion, neck rotation, wrist extension. And the result revealed that stretching exercise was effective in age related flexibility.

M.A. Shakoor, (2007) conducted a study on effects of cervical traction and exercise therapy in cervical spondylosis. He selected 199 patients were treated with cervical traction plus exercise and 99 patients were treated with cervical traction plus

exercise and 99 patients were treated with non-steroidal anti-inflammatory drugs for the duration of 6 weeks. The results indicate that the improvement of the patients with chronic cervical spondylosis was more in traction plus exercise group than and gesies.

Shahnaz, (2012) conducted a study to assess the effects of stretching exercise on primary dysemenorrhea in adolescent girls. He selected 179 single aged 15-17 years with moderate to severe primary dysmenorrheal and divided the participants into 2 groups. In the intervention group, the subjects were requested to complete an active stretching exercise for 8 weeks as 3 days per week, 2 times per day, 10 minutes each time at home. In the pre-test all of subjects were examined for pain intensity, duration and use of sedatives. After 8 weeks of intervention pain intensity was reduced from 7065 to 4.88, pain duration was decreased from 7.48 to 3.86 hours and use of sedative was decreased from 1.65 to 0.79 in the experimental group comparing with control group. Hence stretching exercise are effective in reducing pain intensity, pain duration, and the amount of painkillers in dysmenorrhoea.

Section D

Studies Related toHemodialysis

A.M. Murray, (2007) conducted a study on congnitive impairment on hemodialysis patients is common. Using a cross-sectional design the researcher measured cognitive function in 374 hemodialysis patients using three domains as memory, executive function and language. As a result 13.9% were classified with mild impairment, 36.1% were with moderate impairment, 37.3% with severe impairment and 12.7% with normal cognition. Hence the researcher concludes moderate to severe cognitive impairment is common in hemodialysis patients.

GultekinGenctoy,(2007) conducted a study to assess increased frequency of gall bladder stone and related parameters in hemodialysis patients. He selected 104 hemodialysis patients and 149 control paterients and complete physical assessment was one and the blood samples were drawn via venipuncture from the study participants after they had fasted overnight just before a midweek hemodialysis. As a

result the prevalence of gallbladder stone in hemodialysis patients was 34.6% and that was significantly higher than that of control group 12.9%. The present study showed an increased prevalence of gall bladder stone in hemodialysis patients comparing to healthy controls.

Jessie L Brown, (2007) conducted a study to examine the physiological effects of relaxation music on patients undergoing dialysis treatment. He selected 26 participants and randomized as experimental and control group. The experimental group is allowed to listen to music for 30 minutes and the parameters are evaluated. As a result pain reduction was reported in 23% of the experimental group, as compared to 12% of those in control group and 65% had reduction in systolic blood pressure in experimental, 73% reduction in pulse rate and 54% reduction in respiration and in control group 77% reduction n systolic blood pressure, 61% in pulse rate and 31% reduction in respiration.

Khakha DC, Mahajan, (2008) conducted a study on effect of cryotherapy on arteriovernous fistula puncture related pain in hemodialysis patients. A convenient sample of 60 patients (30 in experimental and 30 in control) who were undergoing hemodialysis by AVF was selected. The study group received cryotherapy and the objective pain behavior and subjective pain assessment by numerical rating scale was assessed. The study found that objective and subjective pain score were found to be significantly (P = 0.001) reduced within the experimental group with the application of cryotherapy. This study highlights the need for adopting alternative therapies such as cryotherapy for effective pain management during AVF puncture.

MarlysBurgett, Michelle Caruer, (2008) conducted a study on effects of calorie and fluid intake on adverse events during hemodialysis. He selected twenty three patients receiving hemodialysis and he collected data regarding amount of fluid and food consumed, mannitol use, blood pressure levels and symptoms during the dialysis. Using regression analysis, calories and fluids were strong predictors of hypotension (P=0.003) and mannitol use (P = 0.000). Hence the study concludes that patients who ate more than 200 calories and consumed more than 200ml of fluid during hemodialysis had an increased incident of hypotensive events.

NahidShahgholian, (2009) conducted a study on effect of aromatherapy on pruitus relief in hemodialysis patients. He used convenient sampling method and selected the subjects undergoing hemodialysis three time a week with pruritis. Before the study 5ml sample was taken from each patients fistula to control the physiological parameters (Phosphrous, parathormone, calcium , blood urea nitrogen. The non allergic patients received 7 minutes of massage in 12 steps in all hemodialysis session for 2 weeks, using mist, lavender and tea tree oils diluted to 5% in sweet almond oil. As a result 65% had mild dryness 5% had moderate dryness and none exhibited severe dryness and the average pruritis score were 5.69 and 2.69 before and after the aromatherapy.

RoozbehShahroodi, Pakfetrat. M, (2010) conducted a study to assess is there an association between intradialytic hypotension and magnesium changes. He selected 58 patients undergoing hemodialysis serum magnesium was measured at start, after 2 hours and at the end of the dialysis session. Blood pressure was measured for every 30 minutes. the data reveals occurrence of intradialytic hypotension among hemodialysis patients was 27.6%. Hence the intradialytic hypotension episodes were significantly related to a decrease in Sr. magnesium during dialysis (P = 0.02).

Bencaplin, (2010) conducted a study on patients perspective of hemodialysis associated symptoms. In this study he surveyed a routine hemodialysis out patients in this the symptoms in relation to the hemodialysis session were analysed using a visual analogue score and in this 82% reported fatigue 76% reported intradialytic hypotension 74% reported Cramps and dizziness (63%) followed by headache (54%) pruritis (52%) and backache (51%). In this 23% reported recovering of symptoms within minutes 34% by the time they returned home, 16% by bed time. Hence despite advances in hemodialysis, intradialytic symptoms were frequently reported by out patients.

Gunalet. al., (2010) conducted a study on Gabapentin for dialysis associated pruritis. He selected 25 patients on hemodialysis with CKD associated pruritis, and administered 300mg of oral gabapentin 3 times weekly for a period of 4 weeks of study and the pruritic effect was measured by VAS, from 8.4% before treatment to

1.2% at the end of 4-weeks of study. Hence the researcher concludes gabapertin appears to be well tolerated, it has the potential to become an important tool in the management of CKD-associated pruitis.

Ali Tayebi, (2011) conducted a study to determine the effect of hypertonic glucose on dialysis adequacy and blood pressure in non diabetic dialysis patients. He did quasi experimental and single group study in which 45 non-diabetic hemodialysis patients were selected and hypertonic glucose infusion 50ml was given three times a week for the period of two weeks, after two weeks durability, patients were assessed without manipulation for two weeks. In addition blood pressure and dialysis adequacy were measured in manipulation phase before and after infusion of hypertonic glucose. the results showed that 25% increase in the rate of dialysis adequacy and also blood pressure of patients had been significantly increased in manipulation phase (P = 0.001). Hence the researcher concludes that injection of hypertonic glucose increased dialysis adequacy in hemodialysis patients significantly and prevented hypotension.

Ali Mahdavi, (2013) conducted a study to explore the efficacy of Benson's relaxation technique for stress, anxiety and depression of patients with hemodialysis. He selected 80 hemodialysis patients from two hospitals as intervention and control group. The Benson relaxation training was implemented in the intervention group for 15 minutes twice a day during 4 weeks. The patients were assessed by depression, anxiety and stress scale before and after intervention. As a result there were significant differences between stress and anxiety levels in case group before and after intervention (P>0.001) and there is no meaningful difference between the mean of depression value in case group before and after intervention (P>0.22). Hence the researcher concludes that instructing Benson's relaxation technique is accompanied by reducing stress and anxiety level of hemodialysis patients.

FakhriSabouhi, (2013) conducted a study on effect of acupressure on fatigue in patients on hemodialysis. 64 subjects were selected based on chief complaint of fatigue and having fatigue score > 5 based on fatigue severity visual analogue scale. The intervention was conducted in the first 2 hour of hemodialysis in the experimental group for 4 weeks as stroking of acupoints in six points (3 minutes for each acupoint).

As a result the total mean score of fatigue and the mean score of fatigue in sensory, behavioral cognitive and emotional dimension is less after intervention compared to before intervention. This results suggests effects of acupressure on fatigue among hemodialysis patients

Wang, (2013) conducted a study on hemodialysis access usage patterns in the incident analysis year and associated catheter- related complications of 25,003 incident dialysis patients 78.5% intiated dialysis with a catheter 16.6% with fistula and 4.9% with graft. At 90 days it is evident that 69.7% had catheter 21.9% had a fistula and 8.4% had a graft reported in complications. The study concludes catheter use remain very high during the first year of hemodialysis care and is associated with high mechanical complication and stream infection rate

CHAPTER – III

METHODOLOGY

Research methodology is the way to systematically solve the research problem. Methodology occupies a key position as far as research documentation is concerned. It may be understood as a science of studying how research is done. It involves systematic procedure by which the researcher starts from the initial identification of the problem to its final conclusion.

This chapter describes the methodology followed to evaluate the effectiveness of intradialytic stretching exercise on Muscle Cramps among patients undergoing hemodialysis in morrismathias hospital at Kanyakumari District.

Research Design

Pre – Experimental, one group pretest posttest design was adopted to this study.

The design can be diagramatically represented as follows

Group	Pre test	Intervention	Post test
Study group	O_1	X (Intradialytic stretching exercise for 20 minutes)	O_2

O_1 –Pre test
X – Intervention (Intradialytic stretching exercise for 20 minutes)
O_2 –Post test

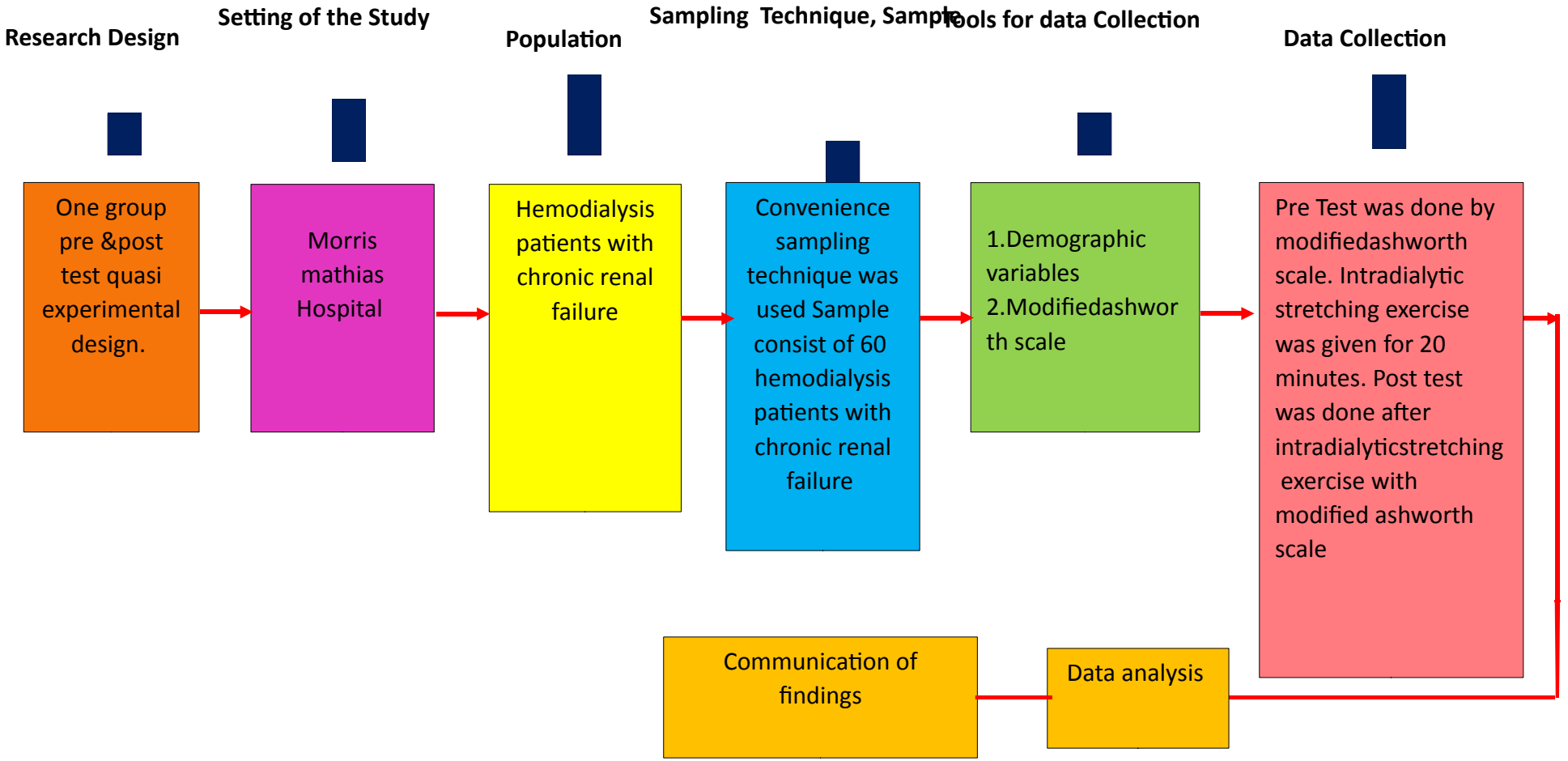


Fig. 2. Schematic Representation of Research Methodology

Variables

Independent variable : Intradialytic stretching exercise
Dependent variable **:** Level of Muscle Cramps.

Research Setting

The setting was chosen on the basis of availability of hemodialysis patient's. The study was conducted in hemodialysis unit of Morris Mathias Hospital at Nagercoil which is 24kms from Thasiah College of Nursing and it is 150 bedded with 13 beds for hemodialysis patients. In which four shifts of hemodialysis is done per day, 13 patients attend per shift and the average outpatients attending hemodialysis ranges from 700-800 per month.

Population

The population for the study was hemodialysis patients with Muscle Cramps between the age of 20-60 yrs, who were admitted for hemodialysis

Sample size

The sample consist of 60 selected hemodialysis patientsbetween the age of 20-60 yrs,who were admitted for hemodialysis in morrismathias hospital.

Sampling Technique

Convenience sampling techniquewas used to select the samples for the study. The samples were selected based on the inclusive and exclusive criteria.

Sample Selection Criteria

The study was conducted based on the following criteria regarding the selection of the sample.

Inclusion *Criteria*

- Patients with the age group of 20 – 60 years
- Patient with moderate to severe Muscle Cramps[6-15] only taken as a sample after assessing with modified Ashworth Scale
- Patient with chronic renal failure
- Patients who are willing to participate

Exclusion *Criteria*

- Emergency hemodialysis patients
- Patient with femoral dialysis catheter&Internal Jugular Vein catheter
- Patients with any lower limb pathology
- Patient with ventilator support

Description of tool

The tool used in this study consists of two parts.

Section A

Demographic variables

This section deals with demographic variables such as age, sex, marital status, education, associated diseases, duration of illness, duration of treatment and medical service.

Section B

Modified Ashworth scale

It involves assessment of muscle tone, muscle strength and range of motion

Scoring and Interpretation:

0 (0%)	→ NoMuscle Cramps
1 – 5 (1-33%)	→ Mild Muscle Cramps
6 – 10 (34-67%)	→ Moderate Muscle Cramps
11 – 15 (68-100%)	→ Severe Muscle Cramps

Validity and Reliability

Contentvalidity of tool was established on the basis of the opinion of six experts. Five experts from the field of M.Sc Nursing and one expert from medical field. The necessary suggestions and modifications were incorporated in the final preparation of the tool. Reliability of the tool was established using inter rater method. The reliability of the score is 0.9. Hence the tool was considered reliable for proceeding with the study.

Pilot Study

Pilot study is defined as, "a small-scale version or trial run, done in preparation of a major study".**Denise F. Polit (2011)**

The pilot study was done after obtaining formal permission from the Principal and the ethical committee of Thasiah College of nursing. The pilot study was conducted at Morris Mathias hospital, Nagercoil after obtaining formal permission from the Director of the hospital. Pilot study was conducted in the month of May (23/5/14 to 29/5/14) for a period of one week. The researcher introduced herself to the study subjects and established good rapport with them. The samples were selected by using convenience sampling technique. Based on inclusion criteria six samples were selected. Intradialytic stretching exercise was given for 20 minutes at the end of second hour of hemodialysis and the post test level of Muscle Cramps was evaluated

by modified Ashworth scale. The researcher showed that the tool was reliable. The researcher has not found any practical difficulties during the time of study.

Data Collection Procedure

The researcher obtained permission from the hospital authorities for conducting the study. Hemodialysis patients with muscle Cramps between the age of 20-60 years were properly informed about theIntradialytic stretching exercise. They were assessed their level of muscle Cramps with Modified Ashworth scale.Among them only 60 chronic Renal Failure patients on hemodialysis having moderate to severe muscle Cramps were taken as a sample by using convenience sampling technique. Information about Intradialytic stretching exercise was given to the study group and obtained the informed consent from study group. Intradialytic stretching exercise was given for 20 minutes in the form ofcalf stretch in gastrocnemius and soleus muscle for 10 mts, flexion, extension of leg 10 times, rotation five times for five minutes duration and elbow flexion, extension, wrist circles five times for four minutes duration , ball fisting for five sec with ten repetitionfor one minute duration. The data was collected for three session of dialysis and post test was conducted immediately after Intradialytic stretching exercise by checking the level of muscle Cramps with the same scale. All the samples were cooperated during the data collection period.

Plan for data Analysis

Data collected was analyzed using both descriptive and inferential statistics such as mean, standard deviation, chi square, paired t test.

Descriptive Statistics

- Frequency and percentage distribution of samples according to demographic variables of hemodialysis patients with Muscle Cramps.

- Frequency and percentage distribution were used to assess the level of Muscle Cramps.

- Mean and standard deviation were used to assess the effectiveness of intradialytic stretching exercise in reducing Muscle Cramps.

Inferential Statistics

- Paired‘t’ test was used to compare pre test and post test level of Muscle Cramps among hemodialysis patients.
- Chi square test was used to find out the association of post test level of Muscle Cramps of hemodialysis patients with their selected demographic variables.

CHAPTER – IV

DATA ANALYSIS

Introduction

The study was conducted to determine the effectiveness ofintradialytic stretching exercise on Muscle Cramps among patients undergoing hemodialysis. The obtained data were analyzed by both descriptive and inferential statistics .The test scores were analyzed by statistical mean and standard deviation. The significance of the difference of mean scores were interpreted by students paired 't' test with the application of statistical package "SPSS" version(13) with the level of significance at 5% (p=0.05).The relationship and association were studied by chi-square test

The data was tabulated and presented as follows

Section-A

Demographic variables of hemodialysis patient selected for the study

Section- B

This section deals with the effect of intradialytic stretching exercise on reducing the level of Muscle Cramps among the selected hemodialysis patients during the hemodialysis period.

i) Assessment of pre test score of Muscle Cramps among hemodialysis patients

ii) Assessment of pre test and post test level of Muscle Crampsamong hemodialysis patients

iii) Effect ofintradialytic stretching exercise on Muscle Crampsamong hemodialysis patients

Section - C

This section deals with association between the demographic variableswith the post test level ofMuscle Cramps of hemodialysis patients.

Section -A

Distribution of the Samples According to Demographic Variables.

Table - 1

Percentage Distribution of Samples According to Demographic Variables

N =60

S.No	Demographic Variables	Number of Frequency	Percentage (%)
1	**Age**		
	20 – 25 years	4	6.7
	26 – 50 years	27	45.0
	51 – 60 years	29	48.3
2	**Sex**		
	Male	26	43.3
	Female	34	56.7
3	**Marital Status**		
	Married	54	90.0
	Unmarried	6	10.0
4	**Education**		
	Illiterate	-	-
	Primary	26	43.3
	Secondary	23	38.3
	Higher Secondary	6	10.0
	Graduate	5	8.4
	Clinical Variables		
5	**Associated Diseases**		
	Diabetes Mellitus	20	33.3
	Hypertension	40	66.7
	Hypocalcemia	0.0	0.0
6	**Duration of Illness**		

	Less than 2 year	3	5.0
	3 – 4 years	44	73.3
	More than 4 years	13	21.7
7	**Duration of Treatment**		
	Less than 2 years	3	5.0
	3- 4 years	44	73.3
	More than 4 years	13	21.7
8	**Medical Service**		
	Self Pay	8	13.3

Table 1: Continues

The above table 1 shows that study samples according to the demographic variables, 4(6.7%) of them were between 20-25 years of age, 27(45%) of them between to 26-50years, 29(48.3%) were between51-60 years.

Related to sex 26(43.3%) of them were male and 34 (56.7%) of them were females.

In relation to the marital status, in the study group out of 60 patients with Muscle Cramps 54(90%) were married 6(10%) were unmarried.

Related to the educational status 0(0%) were illiterate, 26(43.3%) had primary schooling, 23(38.3%) had secondary schooling, 6 (10%) had higher secondary schooling, 5(8.4%) were graduates.

Considering the associated diseases, 20(33.3%) were with diabetes mellitus, 40(66.7%) were with hypertension, and none of them were with hypocalcemia.

Related to the duration of illness, 3(5%) had less than 2 years of illness and 44(73.3%) had 3 to 4 years of illness 13(21.7) had more than 4 years of illness.

Considering the duration of treatment, 3(5%) had less than 2 years of treatment and 44(73.3%) had 3 to 4 years of treatment,13(21.7%) had more than 4 years of treatment.

In medical service 8(13.3) were in self pay and 52(86.7) were in insurance scheme.

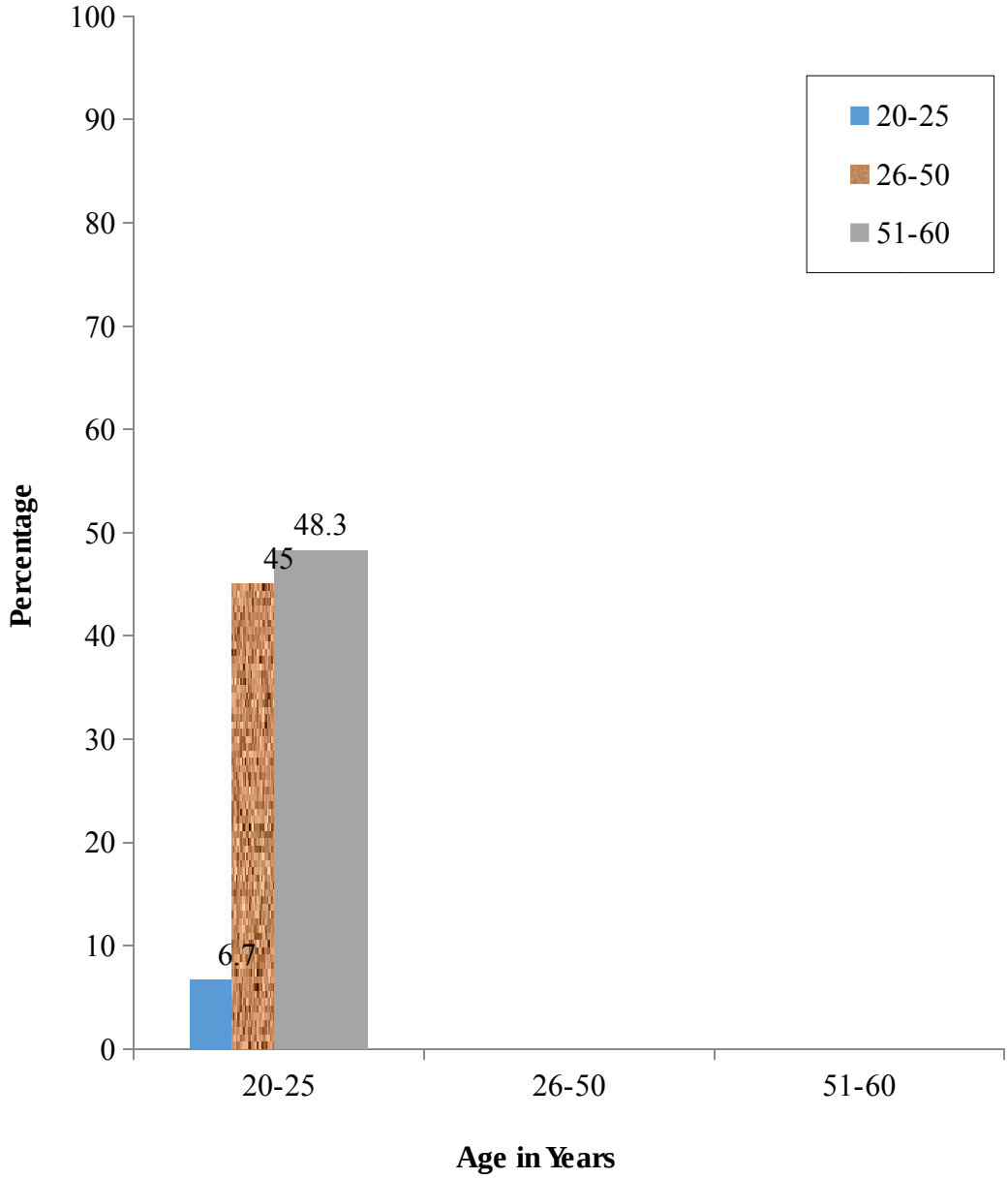


Fig : 3 Percentage Distribution of Demographic Variables According to age

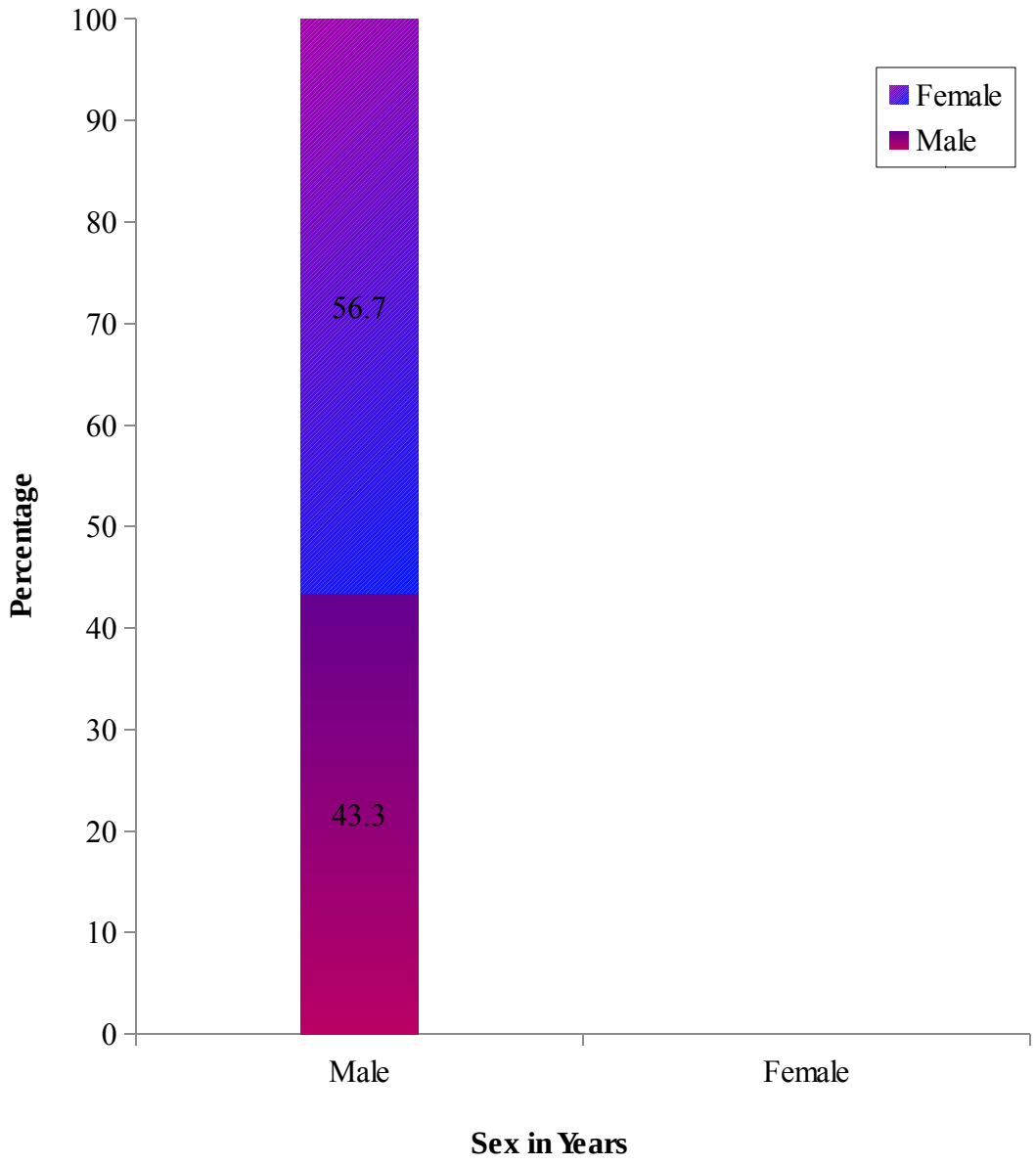


Fig : 4 Percentage Distribution of Demographic Variables According to sex

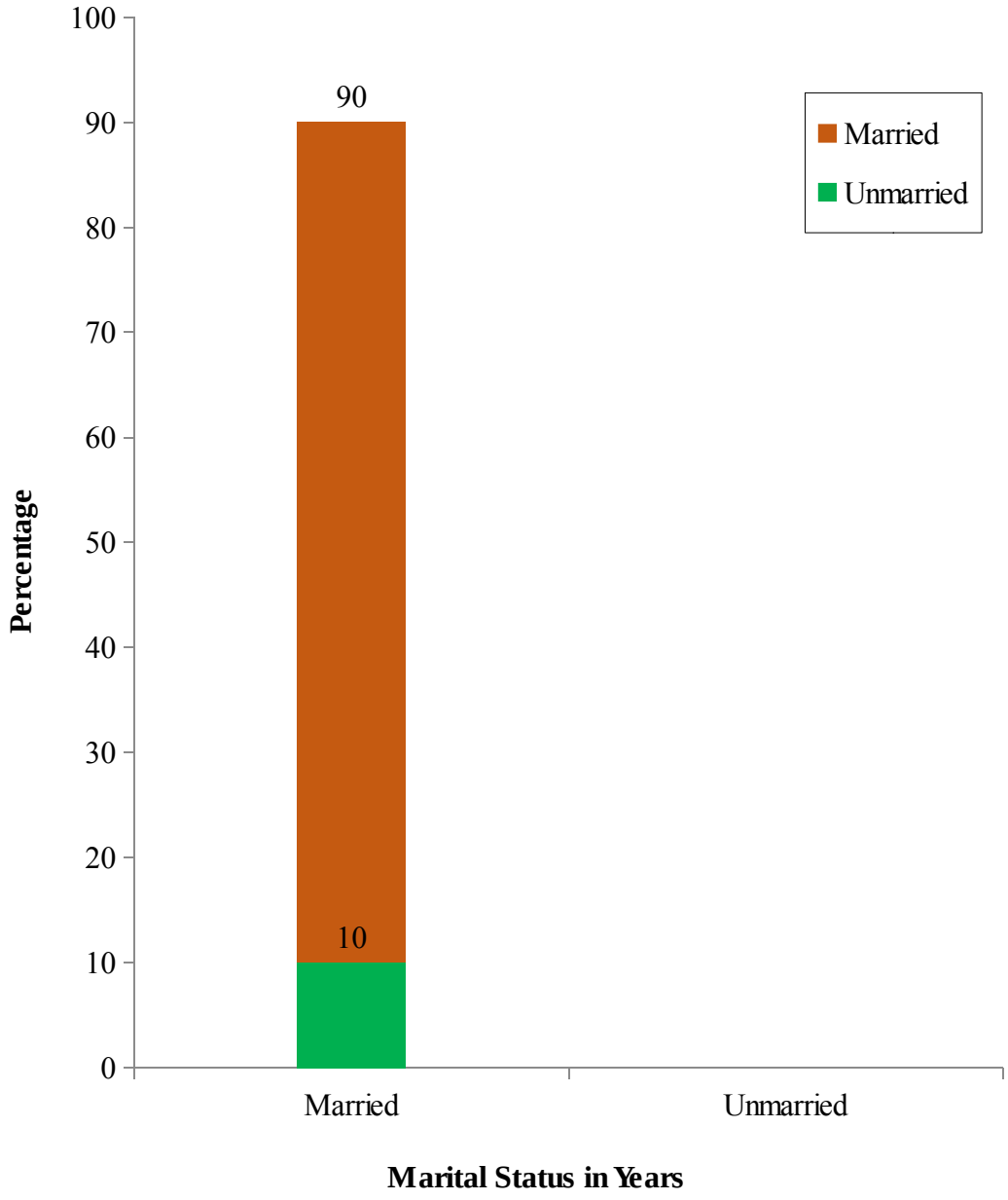


Fig : 5 Percentage Distribution of Demographic Variables According to Marital Status

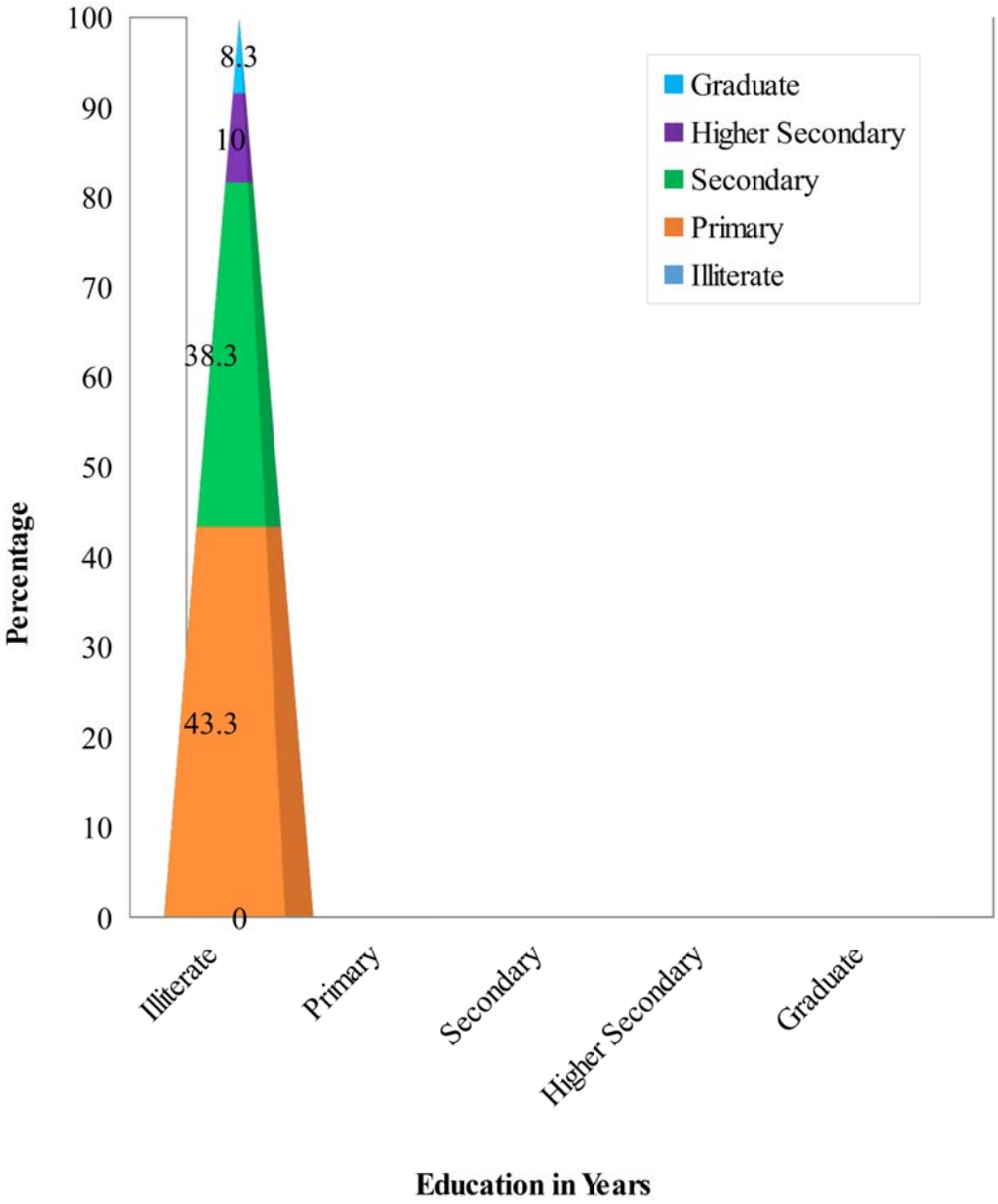


Fig : 6 Percentage Distribution of Demographic Variables According to Education

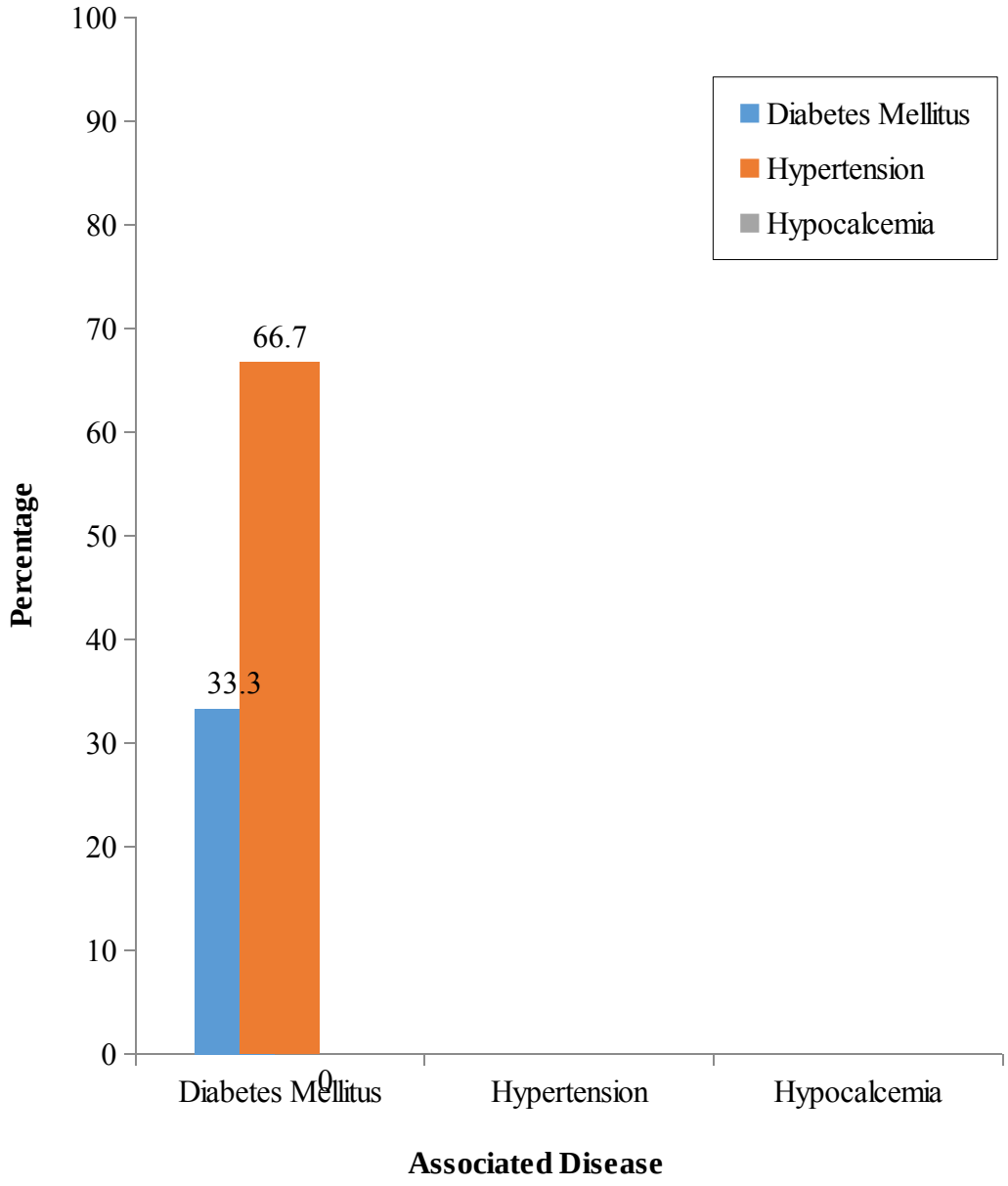


Fig :7 Percentage Distribution of Demographic Variables According to Associated Diseases

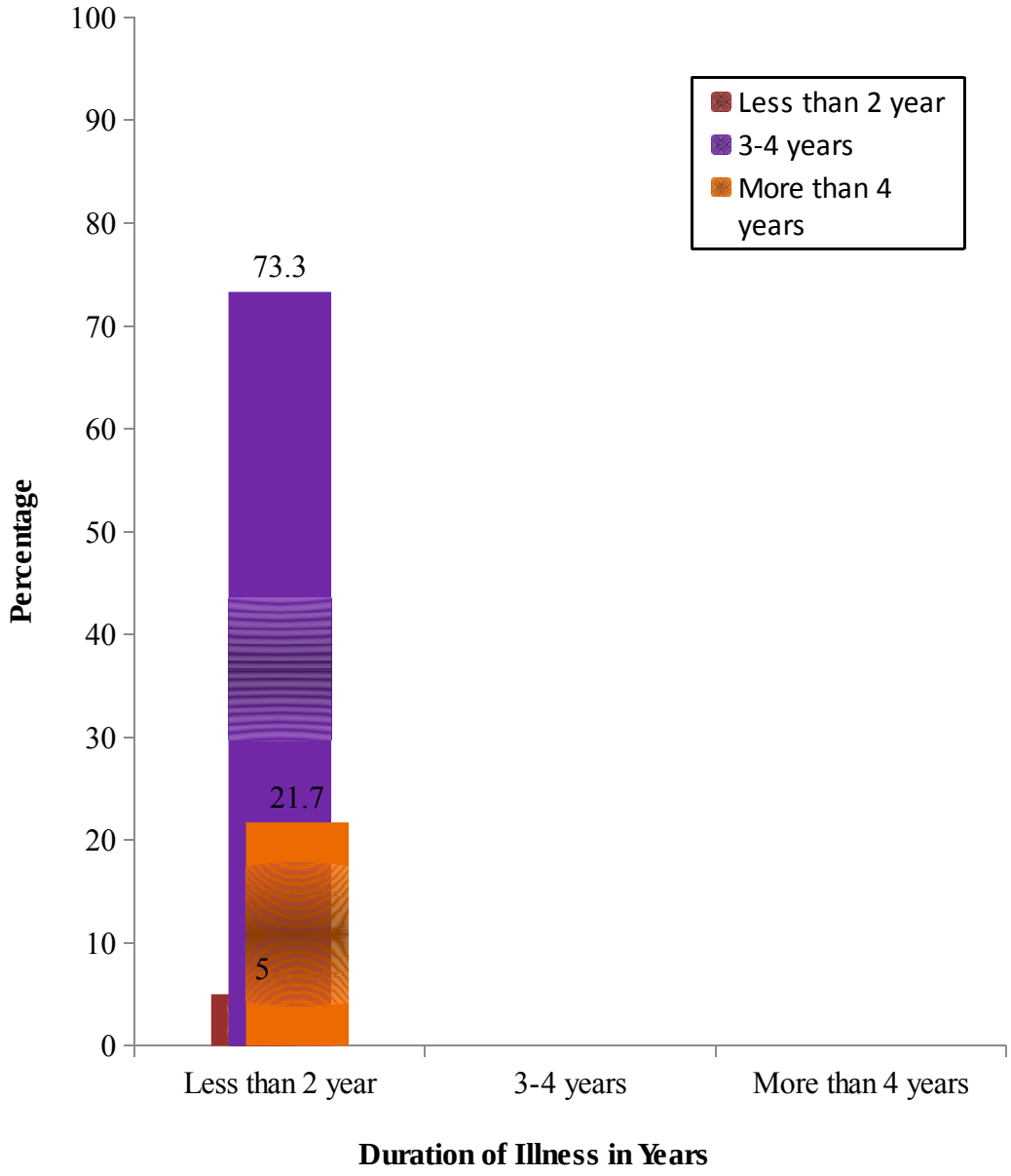


Fig : 8 Percentage Distribution of Demographic Variables According to Duration of Illness

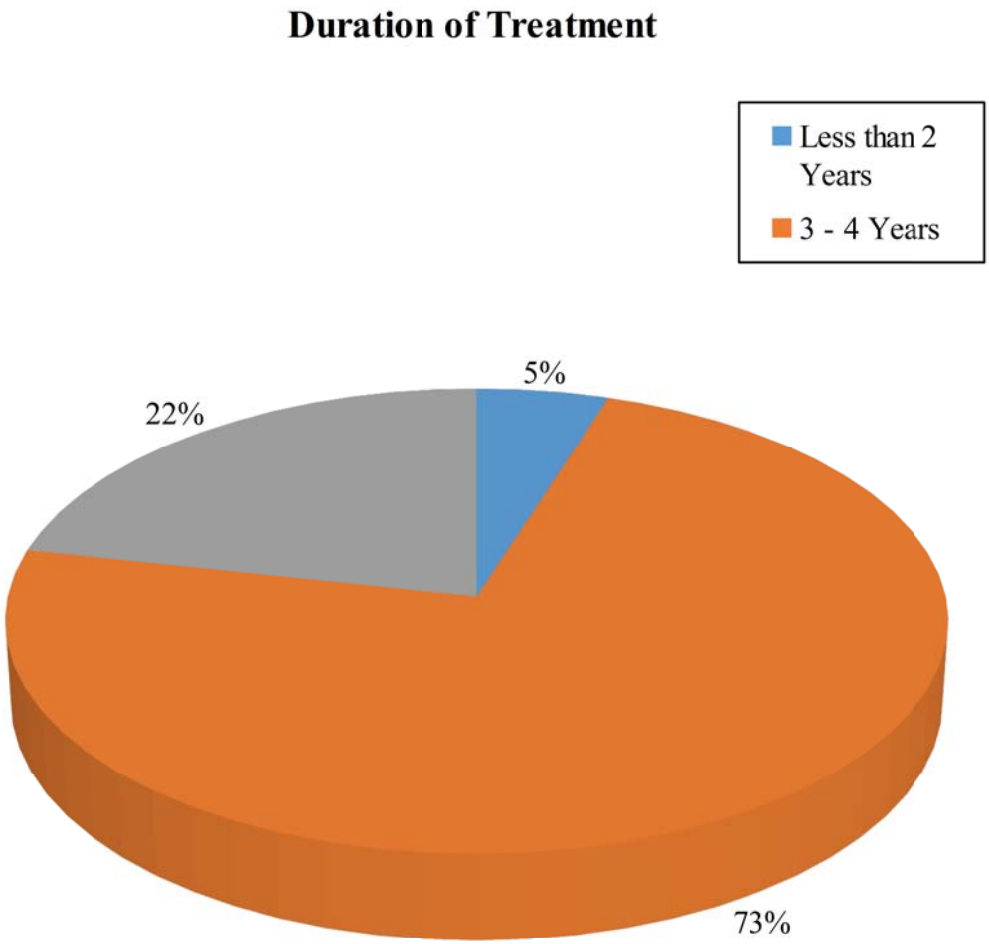


Fig :9 Percentage Distribution of Demographic Variables According to Duration of Treatment

Section - B

Effectiveness of Intradialytic Stretching Exercise on Muscle Cramps Among Patients Undergoing Hemodialysis

Table - 2

Assessing the pre test score on Muscle Cramps Among the Selected Hemodialysis Patients

N =60

Test	Mean	Standard deviation
Pre test	9.86	1.62

The above table indicates that according to modified ashworth scale the mean is 9.86 and the standard deviation is 1.62 before giving intradialytic stretching exercise

Table - 3

Assessing the pre test and post testLevel of Muscle Cramps Among the Selected Hemodialysis Patients

N = 60

Test	Level of Muscle Cramps	f	%
Pre Test	Mild	0	0
	Moderate	18	30
	Severe	42	70
Post Test	Mild	51	85
	Moderate	9	15
	Severe	0	0

The above table shows that the assessment of pre test level of Muscle Cramps among hemodialysis patients during hemodialysis.Most of the patients have severe Muscle Cramps before providing intradialytic stretching exercise.There was 0% mild Muscle Cramps and 30% moderate Muscle Cramps. The mean Muscle Crampsscore of hemodialysis patients was 9.86

In post test assessment of Muscle Crampsmost of patiens have mild Muscle Cramps after providing intradialytic stretching exercise.There was 15% moderate Muscle Cramps and 0%severe Muscle Cramps among hemodialysis patients.The mean Muscle Cramps score of hemodialysis patients was 3.51

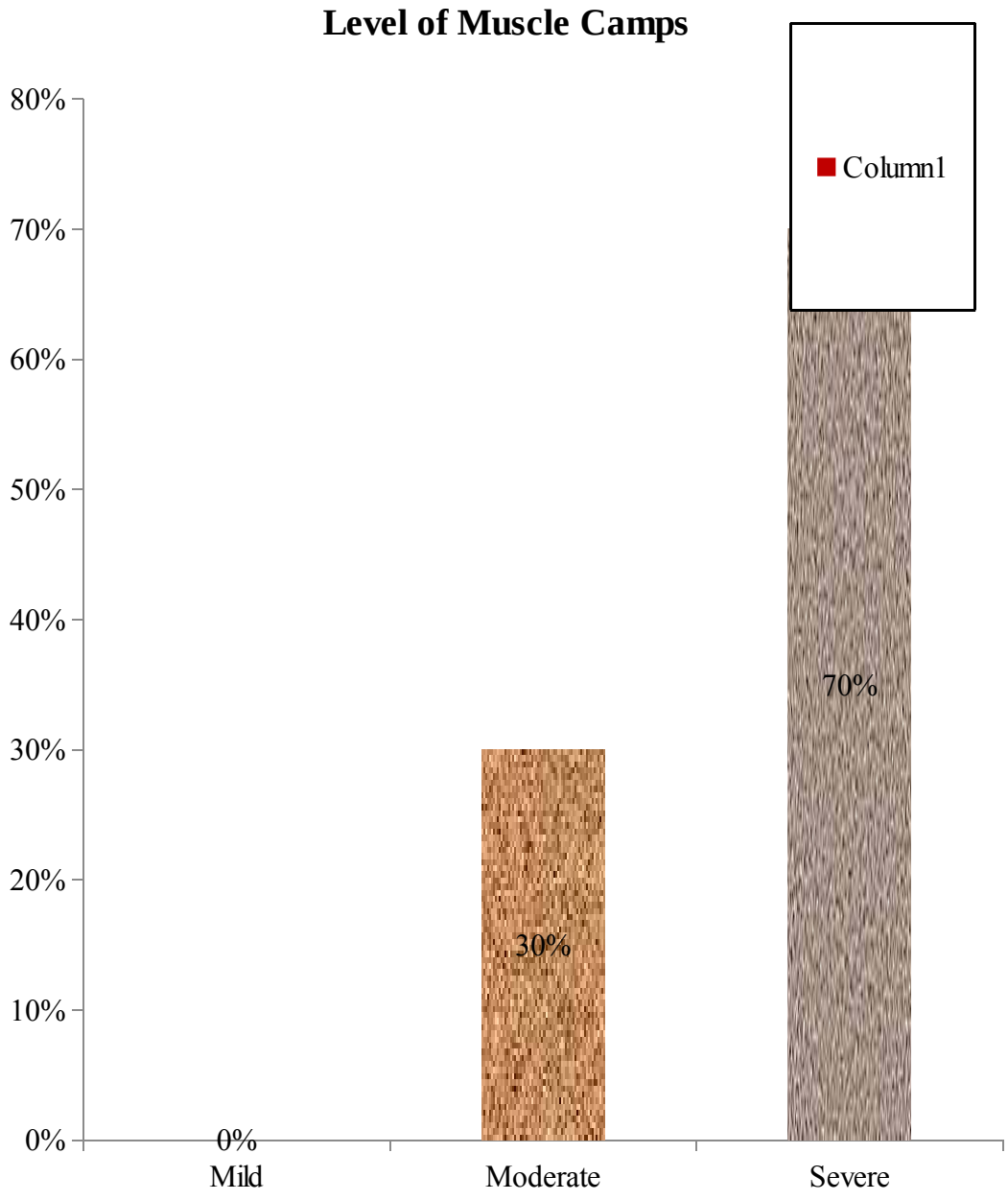


Fig:10Percentage Distribution of Pre test Level of Muscle Cramps

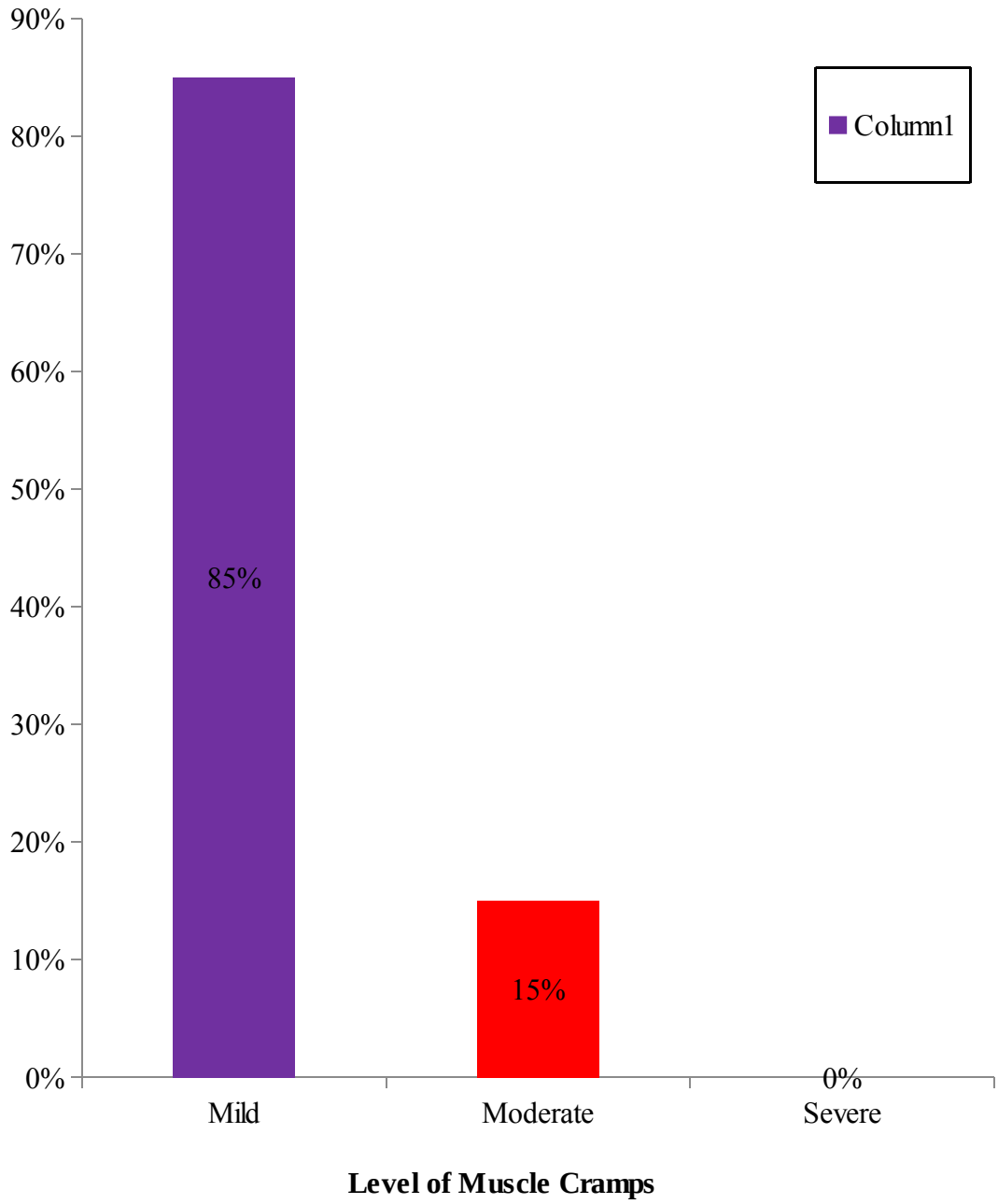


Fig.11: Percentage Distribution of Post test Level of Muscle Cramps

Table -4

Effectiveness of Intradialytic Stretching Exercise on Muscle Cramps Among Patients Undergoing Hemodialysis.

N = 60

S.No	Muscle Cramps	Mean	MD	SD	Paired 't' Value	df
1	Pre Test	9.8	6.3	1.62	30.34*	59
2	Post Test	3.5		1.51		

*Significant at $P < 0.05$

The above table shows the effectivenessof intradialytic stretching exercise on Muscle Cramps among patients undergoing hemodialysis. The reduction of Muscle Cramps frompre test to post test, the mean was 9.8 to 3.5 and in standard deviation 1.62 to 1.51. The mean difference was statistically significant [$t = 30.34$ $df = 59$ and $P < 0.05$]. This shows intradialytic stretching exercise was effective in reducing Muscle Cramps during dialysis.

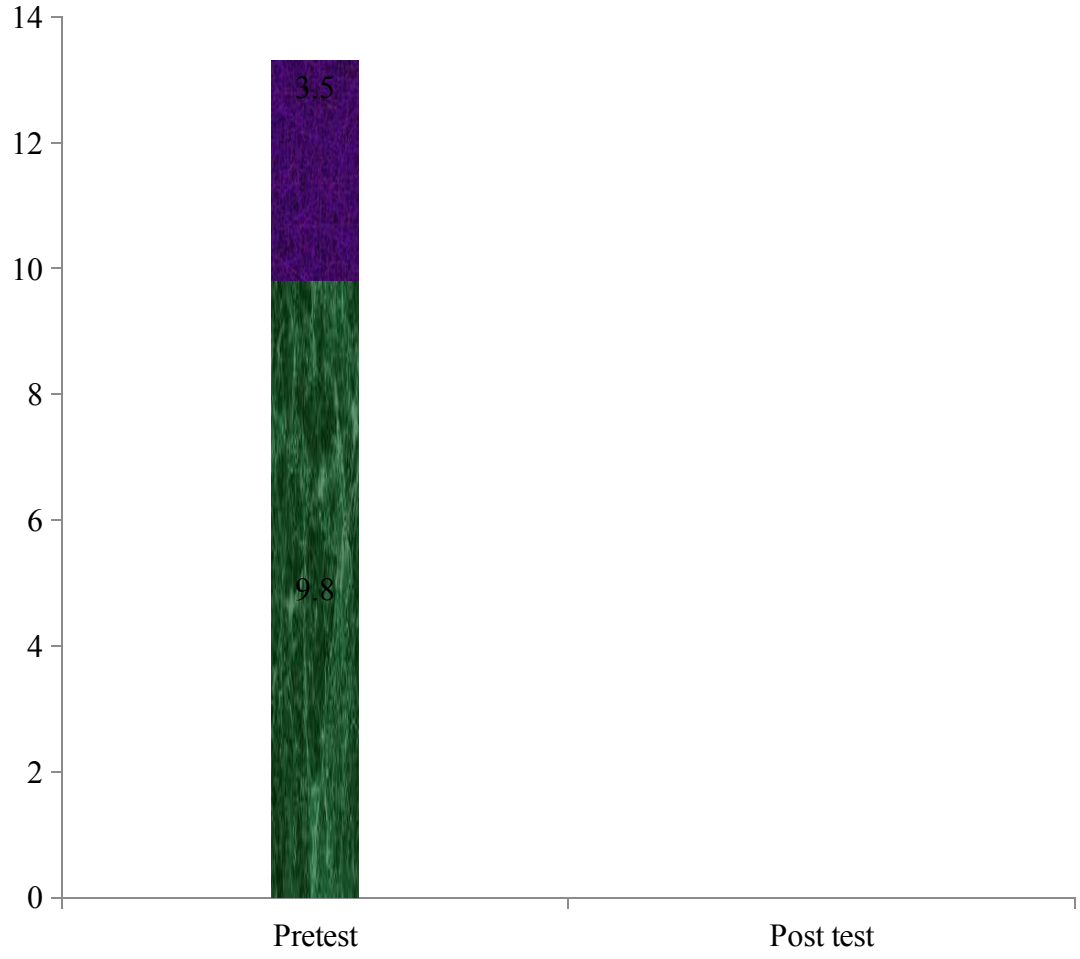


Fig.12: Mean difference in Pretest and post test Score

Section - C

Association Between the Demographic Variables with the post test Score of Hemodialysis Patients.

Table 5

Association of Post test Score on Level of Muscle Cramps with their Selected Demorgraphic Variables

N =60

S.No	Demographic Variables	x^2	df	Significance
1	Age	0.64	2	p>0.05
2	Sex	0.97	1	p>0.05
3	Marital status	1.16	1	p>0.05
4	Education	1.23	3	p>0.05
5	Associated diseases	2.33	1	p>0.05
6	Duration of illness	1.73	2	p>0.05
7	Duration of treatment	1.73	2	p>0.05
8	Medical service	0.04	1	p>0.05

The above table explains that, for the demographic variables age the df is 2 chi-square value is 0.64 and the table value is non significant at P< 0.05. Hence this demographic variable isnot associated with the post test score.

In regard to sex, the df is 1 and the chi-square value is 0.97 and the table value is non significant at P < 0.05. Hence this demographic variable is not associated with post test score.

In marital status, the df is 1 and the chi-square value is 1.16 and the table value is non significant at P< 0.05. Hence this demographic variable is not associated with post test score.

In educational status, the df value is 3 and the chi-square value is 1.23and the table value is non significant atP< 0.05. Hence the educational status is not associated with the post test score.

With regard in associated diseases the df value is 1 and the chi-square value is 2.33and the table value is non significant atP< 0.05 and the associated diseases is not associated with the post test score.

In duration of illness the df value is 2and the chi-square value is 1.73and the table value is non significant at P< 0.05 and this clinical variable is not associated with the post test score.

In duration of treatment thedf value is 2and the chi-square value is 1.73and the table value is non significant at P< 0.05 and this clinical variable is not associated with the post test score.

With regard to medical service the df value is 1 and the chi-square value is 0.04 and the table value is non significant atP<0.05 . Hence this clinical variable is not associated with the post test score

CHAPTER - V

DISCUSSION

The study was undertaken to determine the effectivenes of intradialytic stretching exercise on Muscle Cramps among patients undergoing hemodialysis in Morris Mathias Hospital. Pre experimental design was adopted with one group pre testpost test design for the study. The result and discussion of the study are based on the findings obtained from the statistical analysis.

The First Objective of the Study was to Assess the Level of Muscle Cramps Among Patients Undergoing Hemodialysis Before Giving Intradialytic Stretching Exercise .

The level of muscle Cramps according to Modified ashworth scale, the analysis of pre-test, in study group out of 60 samples, 18(30%) had moderate Muscle Cramps and 42(70%) had severe Muscle Cramps. So it indicates that moderate and severe level of Muscle Cramps was common among hemodialysis patients and they require some relieving measures. It reveals that inModified Ashworth scale the mean score on level of Muscle Cramps among hemodialysis patients in experimental group was 9.86 with the standard deviation 1.62. The paired 't' value was 30.34 which is significant at $p < 0.05$. Hence the research hypothesis is accepted.

Lydia E.Hallscore,care and cure theory based on the first process was to identify the level of Muscle Cramps during second hour of hemodialysis by doing the pre assessment. Here the investigator identified that in the in experimental group out of 60 samples, 18(30%) had moderate Muscle Cramps and 42(70%) had severe Muscle Cramps. The study findings is also congruent with a study conducted by Hungler 2004 in Neyveli general hospital to assess the level of muscle Cramps among patients undegoing hemodialysis. Simple random sampling technique was used to select the study samples. 60 samples were selected. The result showed that in the pre assessment of muscle Cramps on hemodialysis patients with leg Cramps assessment tool 60% of the samples were with severe muscle Cramps ,30% were in moderate muscle Cramps 10% were with mild muscle Cramps.

The Second Objective of the Study was to Assess the Effectiveness of Intradialytic Stretching Exercise on Muscle Cramps Among Patient Undergoing Hemodialysis

In the post test the result shows that, InModified ashworth scale, the mean score on level of Muscle Cramps among hemodialysis patients was 9.86 in pre test and 3.51 in post test. The paired‘t’ value was 30.34 which is significant at $p < 0.05$. It shows that intradialytic stretching exercise was effective in reduction of Muscle Cramps among hemodialysis patients. Hence the research hypothesis was accepted. The study finding is in congruent with the study by PandruluGowthami. (2012) on intradialytic stretching exercise on Muscle Cramps among patients undergoing hemodialysis in kolar hospital. The findings shows that there was a significant reduction in Muscle Cramps after intradialytic stretching exercise

The study finding is also congruent with a study conducted byManchunathan (2008) in Nephrology department, Karnataka to assess the effect of intradialytic stretching exercise on Muscle Cramps among patients undergoing hemodialysis. Random sampling technique was used to select the study samples. 60 samples were selected, 30 samples were the experimental and 30 were control group. The results showed that there was a significant difference in the Muscle Cramps between experimental and control group after intradialytic stretching exercise at 0.05 level of significance. Thus the intradialytic stretching exercise was effective in reducing Muscle Cramps among patients undergoing hemodialysis.

Based on this theory, the second circle was rendering the care and the third circle was evaluation of the pathological and therapeutic sciences applied by health team members. Here the investigator gave intervention(Intradialytic stretching exercise) and evaluated there is a reduction in the level of Muscle cramps bycomparing the pre test and post test level of Muscle Cramps among hemodialysis patients.

The Third Objective was to Find out the Association Between the Level of Muscle Cramps Among Patients Undergoing Hemodialysis with their Selected Demographic Variables.

The significant reduction was made by the effect of intradialyticstretching exercise in relieving muscle Cramps without the influence of any demographic variables such as age, sex, marital status, education, associated diseases, duration of illness, duration of treatment and medical service. There was no association of demographic variables with the level of muscle Cramps in the post test$p>0.05$

From the above results and discussion clearly stated that there was no significant association of muscle Cramps with the various demographic variables such asage, sex, marital status, education, associated diseases, duration of illness, duration of treatment and medical service. Thus the researcher rejected the research hypotheses.

CHAPTER -VI

SUMMARY ANDRECOMMENDATION

This chapter deals with the summary of the study,limitation and the conclusion drawn from the study.It also explain the implications of the study,for different areas like nursing education,nursing administration,nursing practice and nursing research

Summary

This study was conducted to find out the effectiveness of intradialytic stretching exercise on Muscle Cramps among patients undergoing hemodialysis in Morris Mathias hospital Nagercoil, at Kanyakumari District

Objectives of the Study

- To assess the level of Muscle Cramps among patients undergoing hemodialysis before giving intradialytic stretching exercise.
- To assess the effectiveness of intradialyticstretching exercise on Muscle Cramps among patient undergoing hemodialysis.
- To find out the association between the level of Muscle Cramps among patients undergoing hemodialysis with their selected demographic variables.

Hypotheses

H_1: There is a significant difference in the level of Muscle Cramps after intradialytic stretching muscle exercise among patients undergoing hemodialysis.

H_2 : There is a significant association between the level of Muscle Cramps among patients undergoing hemodialysis with their selected demographic variables.

This study was undertaken to assess the effectiveness of intradialytic stretching exercise on Muscle Cramps among hemodialysis patients. Quantitative research approach was used for this study. Pre Experimental, one group pre testpost

test design was adopted to this study. The study was conducted among the hemodialysis patients in Morris mathiashospital,Nagercoil . Convenience sampling technique was adopted to select samples.

Data collection was done by using Modified ashworth scale.Intradialytic stretching exercise was administered for study group. The data gathered were analyzed by descriptive and inferential statistical method and interpretation was done on the basis of the objectives of the study.

Study Findings

The data was collected and analyzed by using descriptive and inferential statistics. The findings revealed that there was highly significant difference in level of Muscle Cramps among hemodialysis patients after the administration of intradialytic stretching exercise. In the post test the result shows that, the mean post test score was 3.51 with standard deviation of 1.51. The mean difference was 6.35. The obtained paired‘t’ test value is 30.34 which is more than the table value (P=2.00) with the degree of freedom 59 at 0.05 level of significance. Hence the Research Hypothesis (H_1) was accepted and it was inferred that intradialytic stretching exercise is effective in reducing the level of Muscle Cramps among hemodialysis patients.

Conclusion

The findings of the study are as follows :

- Intradialytic stretching exercise is effective in reducing Muscle Cramps among patients undergoing hemodialysis.
- Intradialytic stretching exercise is not having any side effects.

Nursing Implications

The researcher has derived the following implication from the study results which are of vital concern to the field of nursing service, nursing administration,

nursing education and nursing research. By assessing the effectiveness of Intradialyticstretching exercise to reduce the level of Muscle Cramps among hemodialysis patients, we got a clear picture regarding different steps to be taken in all fields, to improve the standard of nursing profession and implement evidence based practice in health set up.

Nursing Practice :

- Performance of intradialytic stretching exercise is a safe and better modality which has no side effects.
- Intradialytic stretching exercise can be practiced as a routine one in dialysis unit.
- Intradialytic stretching exercise can be used as a protocol for treating hemodialysis related muscle cramps in all dialysis setting.
- Nurses can implement this Intradialytic stretching exercise and enhance the effectiveness of patient outcome through case presentations.

Nursing Education :

- Nurse educator can train and encourage the student nurses to utilize intradialytic stretching exercise as an alternative complimentary therapy to reduce Muscle Cramps among patients undergoing hemodialysis.
- This study can motivate student nurses to explore new strategies for effective reduction of Muscle Cramps.
- This research report can be kept in library for reference of nursing personnel and other health care professionals.
- Intradialytic stretching exercise intervention can be integrated with nursing curriculum.
- The nurse educators encourage to conduct in service education program on Intradialytic stretching exercise to their staff working in the dialysis unit.

Nursing Administration :

- Nurse administrator can prepare the protocol regarding Intradialytic stretching exercise.
- Intradialytic stretching exercise is one of the best nursing intervention in reducing Muscle Cramps among patients with hemodialysis.
- The nurse administrator should encourage the student and staff members to actively participate in seminars, workshop and conferences regarding intradialytic stretching exercise in reducing Muscle Cramps.
- Intradialytic stretching exercise can be recommended in hospital along with routine management of Muscle Cramps.
- Nurse administrator can recognize intradialytic stretching exercise as a cheap, cost effective method in the management of Muscle Cramps.
- Nursing administrator can instruct and encourage their subordinates to utilize this as a intervention in their clinical setting.

Nursing Research :

- Nurse researcher can do studies related to other beneficial effects of Intradialytic stretching exercise.
- A comparative study can be done to determine the effectivenes of intradialytic stretching exercise with other alternative therapies.
- Similar study can be done for the large population. So it could be generalized.

Limitations

1. Convenience sampling technique was used
2. The sampling size was 60

3. The data collection period was only one month

4. The study was limited only to the patients attending hemodialysis unit in Morris Mathias hospital during the period of data collection.

Recommendations

1. A similar study can be conducted among large samples.

2. Comparison between intradialytic stretching exercise and other non – pharmacological methods can be done.

3. Studies can be done to assess the knowledge and practice of nursing staff regarding intradialytic stretching exercise.

4. The intradialytic stretching exercise can be included in the hospital policy.

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LETTER SEEKING PERMISSION TO CONDUCT STUDY

THASIAH COLLEGE OF NURSING
(Approved by Govt, of Tamilnadu, TN-Nurses & Midwives Council
Indian Nursing Council & Affiliated to Dr. M.G.R. Medical University)
Marthandam, Vellivilagam, Viricode - 629 165
Kanyakumari District. Tamil Nadu, India.
Phone : 04651 - 270996, 9487251600
web : www.tcnursing.net, email : info@tcnursing.net

Mr.C.Thasian
Chairman

22/5/2014

From

The Principal
Thasiah College of Nursing
Marthandam

To

The Medical Director
Morris Mathias Hospital
Nagercoil

Respected Madam / Sir,

Ms. Magilin Sheeba is a student of M.Sc (N) programme from the clinical speciality Medical Surgical Nursing in our college. She is conducting a study on "A study to assess the effectiveness of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis in Morris Mathias Hospital.

This is for the research project to be submitted to the TamilNadu Dr. MGR Medical University in the partial fulfillment of university requirement for the award of M.Sc. (N) Degree and will be beneficial in understanding and improving the health of the patient.

As a part of her study she need to observe the level of muscle cramp among patients undergoing hemodialysis in your hospital. So permission may kindly be granted for her to conduct the study at your esteemed hospital. She will abide by the rules and regulations of your hospital.

Thanking you,

PRINCIPAL
Thasiah College of Nursing
Marthandam - 629 165

LETTER GRANTING PERMISSION TO CONDUCT STUDY

Morris Mathias Hospital
MMH

Dr. Mathias Nagar, Nagercoil - 629 001.
Phone : (04652) - 279902, 279903, 279904,
279905, 279906,Fax:04652-279907

23/05/2014

To,

The Principal

Thasiah College of Nursing,

Marthandam,

Kanyakumari Dist.

Dear Sir / Madam,

Sub : Granting of permission to conduct a study in our hospital for your M.Sc., (N) student Ms. Magilin Sheeba.

Ref : Your letter dated 23/05/2014.

With reference to your letter cited above. We here by inform you that our hospital will be able to allow your M.Sc., (N) student Ms. Magilin Sheeba to conduct a study of Muscle Cramp among patients undergoing hemodialysis.

The student must be in full uniform with name identity and Rs. 500/- to be pay as our institutional fees.

Thanking you,

Yours Sincerely

10/6/14.

Director : **Dr. M.R. Morris,** F.R.C.S. (Ed.)

LETTER SEEKING EXPERTS OPINION FOR THE VALIDITY OF THE TOOL

From

MagilinSheeba. H.
M.Sc. Nursing II year ,
Thasiah College of Nursing,
Marthandam.

To

Respected Sir/Madam,

Sub: Requisition to expert opinion and suggestion for the content validity.

I MagilinSheeba. H., M.Sc. Nursing II year student of Thasiah College of Nursing,Marthandam, have selected the following topic, **" A study to assess the effectiveness ofintradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis in Morris Mathias hospital Nagercoil, at Kanyakumari District."**for my dissertation to be submitted to Tamilnadu Dr. M.G.R. Medical University in the partial fulfilment of the requirement for award of Master of science in Nursing.

I request you to go through the items and give your valuable suggestions and opinions to develop the content validity of the tool. Kindly suggest modifications, addition and deletions if any in the remarks column.

Thanking You,

Place :Marthandam Yours Sincerely,

Date :MagilinSheeba. H.

ENCLOSURE

1. Problem Statement, objectives, and hypothesis of the study
2. Demographic profile
3. Modified Ashworth Scale
4. Evaluation Proforma.

LIST OF EXPERTS VALIDATED THE TOOL

1) Dr.Prem Kumar, M.B.B.S, M.D.(Nephro),

Nephrologist,

Morris Mathias Hospital,

Nagercoil.

2) Dr. Stalin Jose, M.D,
The Medical Officer,
Primary Health Centre,

Oovari.

3) Mrs.Janet, M.Sc (N),

Vice Principal,

Saraswathy College of Nursing,

Karode.

4) Dr. SharmilaJansi, M.Sc(N).PhD.(N),

Professor,

Christian College of Nursing,

Neyyoor.

5) Mrs. V. Sherin, M.Sc (N),

Assistant Professor,

C.S.I College of Nursing,

Karakkonam,

Trivandrum District.

6) Mrs. Rajam, M.Sc (N),

Assistant Professor,

C.S.I College of Nursing,

Karakkonam,

Trivandrum District.

7) **Mrs. AjithaJothi, M.Sc (N),**
Associate Professor,

C.S.I College of Nursing,

Karakkonam,

Trivandrum District.

EVALUATION CRITERIA CHECK LIST FOR VALIDATION OF THE TOOL

Instruction :

Kindly give your suggestions regarding the accuracy, relevance and appropriateness of the content. Kindly (✓) against specific columns.

PART - I

Validation of Demographic Variables

Item	Very Relevant	Relevant	Need for Modification	Not Relevant	Remarks
1					
2					
3					
4					
5					
6					
7					
8					

PART - II :

Validation of Modified Ashworth Scale

Item	Very Relevant	Relevant	Need for Modification	Not Relevant	Remarks
1					
2					
3					

EVALUATION CRITERIA CHECKLIST FOR VALIDATING THE TOOL

Instructions:

The expert is requested to go through the following criteria for evaluation. Three columns are given for responses and a column for remarks. Kindly please tick mark in the appropriate columns and give remarks.

Interpretation column:

Column1: meets Criteria, **Column 2**: partially meets criteria,**Column3**: does not meet the criteria

S.NO	CRITERIA	1	2	3	REMARKS
1.	SCORING • Adequacy • Clarity • Simplicity				
2.	CONTENT • Logical sequence • Adequacy • relevance				
3.	LANGUAGE • appropriate • clarity • simplicity				
4.	PRACTICABILITY • Easy to score • Precise • utility				

Signature :

Name :

Designation :

Address :

Any other suggestion:

TOOL FOR DATA COLLECTION

SECTION : A

Structure questionnaire for the demographic variables collection

Dear participants you are requested to answer all items. This information will be treated as confidential. Kindly put a (✓) mark to answer to which you respond in the specific column, provided in the right side of the questionnaire.

Sample No: _____

Demographic Data

1) Age
    a) 20 – 25 years
    b) 26 – 50 years
    c) 51 – 60 years

2) Sex
    a) Male
    b) Female

3) Marital Status
    a) Married
    b) Unmarried

4) Education
    a) Illiterate
    b) Primary
    c) Secondary
    d) Higher Secondary
    e) Graduate

Clinical Data

5) Associated Diseases
    a) Diabetes Mellitus
    b) Hypertension
    c) Renal disorder

6) Duration of Illness
    a) Less than 2 year
    b) 3 – 4 Years
    c) More than 4 Years

7) Duration of treatment
    a) Less than 2 year
    b) 3 – 4 Years
    c) More than 4 Years

8) Medical Service
    a) Self Pay
    b) Insurance Scheme

SECTION :B

MODIFIED ASHWORTH SCALE

Instruction

Kindly go through each item of the questionnaire carefully and indicate your response by placing a (✓) mark in the box

Muscle tone	0 - No increase in muscle tone 1 - Slightly increase with a catch 2 - Minimal resistance with catch 3 - Marked increase in tone 4 - Considerable increasing in tone 5 - Affected part rigid
Muscle Strength	0 - Normal power (overcome resistance) 1 - Movement against resistance 2 - Movement against gravity 3 - Movement possible 4 - Palpable contraction 5 - Marked muscle contraction
Range of Motion	0 - Possible 1 - Flexion possible 2 - Extension possible 3 - flexion impossible 4 - Extension impossible 5 - Flexion, Extension impossible

Interpretation:

0 (0%) → No Muscle cramp

1 – 5 (1-33%) → Mild Muscle cramp

6 – 10 (34-67%) → Moderate Muscle cramp

11 – 15(65-100%) → Severe Muscle cramp

PROTOCOL FOR INTRADIALYTIC STRETCHING EXERCISE

Introduction

Stretching is a form of physical exercise in which a specific muscle or tendon (or muscle group) is deliberately flexed or stretched in order to improve the muscle's felt elasticity and achieve comfortable muscle tone. The result is a feeling of increased muscle control, flexibility and range of motion. Stretching is also used therapeutically to alleviate cramps.

Definition

Stretching, as it relates to physical health and fitness, is the process of placing particular parts of the body into a position that will lengthen, or elongate, the muscles and associated soft tissues. –Brand 2008.

Intradialytic stretching exercise is the exercise performed actively and passively of the affected muscles pertaining at the end of second hour of hemodialysis –Sharman 2006.

Purpose

- Increases functional capacity.
- Improves muscle strength and power muscle atrophy.
- Reduce cramp of the muscles.
- Improves overall health and physical fitness**.**
- Increases blood flow.
- Promotes range of motion.
- Promotes muscle tone.
- Promotes joint stability.

Mechanism of Action

During muscle cramp

↓

Electromyographic activity will be high

↓

Paroxysm of muscle spasm

↓

Stretching invoke afferent activity from golgitendon organ

↓

Relief from muscle cramp

Indication

- Patients with muscle cramp during hemodialysis
- Limited range of motion
- Muscle shortening
- Athletic individuals

Contraindication

- Patients with upper and lower limb pathology
- Uncoperative individuals
- Client with nerve injury
- Joint instability
- Vascular injury
- Excessive pain
- Joint effusion

Duration

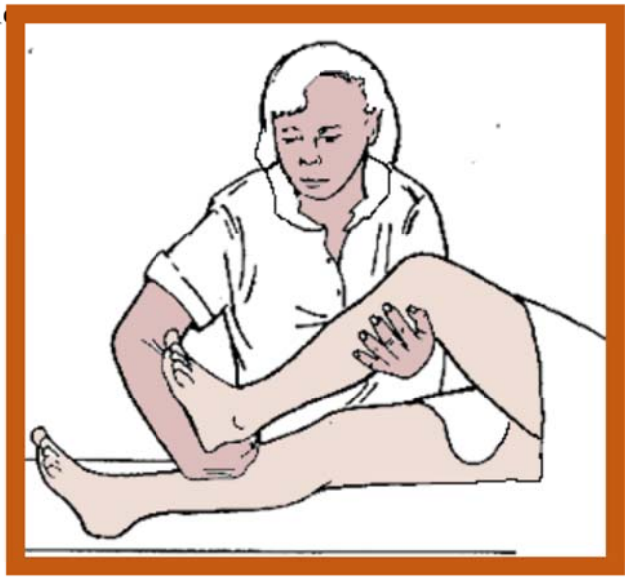
20 minutes

Procedure

1. Calf Stretch

Extend the knee, place the other hand on top of the ankle, and push in the opposite direction for 5 mts - To stretch the gastrocnemius muscle

Flex the knee, place the other hand under the calf, and push in the opposite direction for 5 mts - To stretch the soleus muscl



2.Leg Exercises

Flexion of leg

In a lying down position bend the joint, move the lower leg towards the back of the thigh.- resulting in a decrease of angle.

Extension

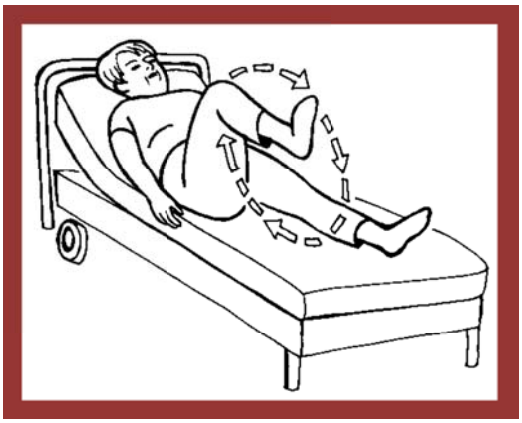
In a lying down position straighten the joint; move the lower leg away from the back of the thigh. The flexion and extension carried out for 10 times - resulting in an increase of angle

Medial Rotation (Internal Rotation)

In a lying down position rotary movement around the longitudinal axis of the bone toward the center of the body; with the knee bent, turning the lower leg inward.

Lateral Rotation (External Rotation)

In lying down position the legs are moved rotary movement around the longitudinal axis of the bone away from the center of the body; with the knee bent, turning the lower leg outward. The rotation is carried out 5 times



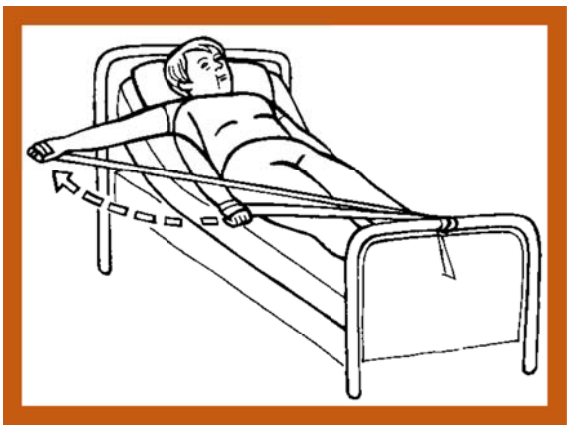
Ankle Movement (Dorsiflexion / Plantarflexion)

In a lying position with affected leg stretched out in front . Push the foot downwards to point toes. Pull foot gently upwards, back towards the body until you feel a stretch in the back of the calf. Return to the start position.- to improve circulation

3. Arm Exercises

Elbow flexion / extension

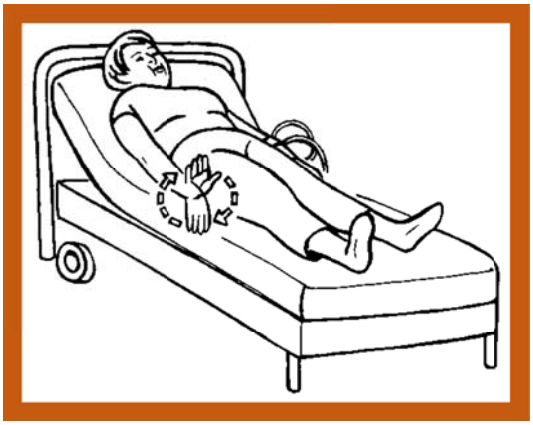
Place the arms down at side with elbows straight. Bend the elbow andbring the hand up to touch the shoulder .Repeat 5 times



Wrist circles

Rest the forearm firmly on table top and hang the wrist overthe edge of the table.

Move the wrist in circles to the right and to the left .Repeat 5 times



Ball fisting in arms

Hand squeezes can be performed with a tennis ball, a rubber stress ball, a hand gripper or simply by pumping the fist. Squeeze as hard as possible for five seconds before releasing. Aim for 10 repetitions in each set.- to promote circulation

After care

- Make the patient comfortably in a supine position
- Assess hemodynamic parameters such as heart rate, blood pressure and respiration
- Assess for joint stability in all extremities

- Assess range of motion in all extremities
- Assess severity of muscle spasm in the calf muscles

Conclusion

Prolonged involuntary muscle contractions or Muscle Cramps that occur late in dialysis and typically involve the legs are the most neuromuscular complication observed during hemodialysis they occur in 5 to 20% of treatments and frequently lead to premature discontinuation of dialysis. Various modalities has been implemented to reduce Muscle Cramp but finally stretching exercise during dialysis, targetting the affected muscle groups may be beneficial

PHOTOGRAPHS